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Animal languages in eighteenth-century German philosophy and science

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ABSTRACT

This paper analyzes debates on animal language in eighteenth-century German philosophy and science. Adopting a history of ideas approach, I explain how the study of animal language became tied to the investigation into the origin and development of language towards the end of the eighteenth century. I argue that for large parts of the eighteenth century, the question of the existence of animal languages was studied within the context of the philosophical question of whether animals possess reason. In Germany, the debate concerning animal reason was influenced by Christian Wolff and was taken up by diverse thinkers such as Winkler, Meier, and Reimarus. I argue that in the second half of the eighteenth century the study of animal language became more loosely related to the question of whether animals possess reason: animal language was studied not only in light of the debate on animal reason but also because it sheds light on the nature of animals, on the differences and similarities between animals and humans, and on the origin and development of language. This systematic study of animal language coincided with the rise of linguistics, anthropology, and biology as independent sciences.

1. Introduction

In the twenty-first century, research into animal communication and language is a thriving scientific field (Shettleworth, 2010, chap. 14; Meijer, 2019). In this paper, I analyze debates concerning animal language in eighteenth-century German philosophy and science. My aim is to describe how, at the end of the eighteenth century, the study of animal language became connected to the study of animals and to the study into the origin and development of language. I argue that for large parts of the eighteenth-century, the study of animal language was conducted within the context of the philosophical debate surrounding animal reason. The debate on animal reason in Germany was influenced by Christian Wolff, who denied that animals have reason and language. Operating within this Wolffian paradigm, authors such as Winkler, Meier and Reimarus debated questions concerning the existence of animal language within the larger debate concerning the existence of animal reason. This situation changed in the second half of the eighteenth century. Authors such as Herder and Tetens, influenced by French authors, engaged in the debate on the origin and development of language and softened the link between the study of animal language and the debate concerning animal reason. I do not wish to claim the debate surrounding animal reason disappeared, for it informs animal studies up to the present day. However, my claim is that these authors also studied animal language because it informs us on the behavior of animals, on the human-animal boundary, and on the phenomenon of language. This systematic study of animal language took place when linguistics, anthropology, and biology emerged as autonomous sciences.

The historical study of animal cognition has received increasing attention in recent years (Richards, 1987; Ingensiep, 1996; Cheung, 2006; Riskin, 2016; Buchenau & Lo Presti, 2017; Van den Berg, 2018, 2020). However, historical studies of animal language are rare. Exceptions include the study of animal language from Darwin to the present in Radick, 2007, the discussion of animal language and the collapse of the animal-human boundary in the early-modern period by Wolfe, 2017, with a focus on the French and English context, and the discussion of bird song from Aristotle to Kant in Smith, 2017. In contrast to these authors, I adopt a history of ideas approach and discuss how the study of animal communication became a subject related to the investigation of animals and the origin and development of language, focusing on eighteenth-century Germany. My research engages with several studies on Herder and the development of German philosophy of language, linguistics, biology, and anthropology in the eighteenth century (Zammito, 2002, 2017, 2018; Forster, 2010, 2019). I contribute to this literature by focusing on animal language, which is little discussed, and by arguing that the study of animal language in the context of investigations into animals and language coincided with the rise of the disciplines of linguistics, anthropology and biology.

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The paper has the following structure. In section 2, I discuss why Wolff denied animals language and reason. I argue that Wolff's discussion of animals, reason, and language provided a framework for the philosophical discussion of animals in eighteenth-century Germany. Section 3 discusses how the question of animal reason and the question of animal language are connected in the works of Winkler, whereas section 4 discusses the debate of degrees of reason and animal language in the writings of Meier and Reimarus. In section 5, I discuss French debates on animal cognition and the origin and development of language and how these debates impacted the German discussion. Section 6 discusses how Herder and Tetens engaged in the debate on the origin and development of language and broke with the Wolffian paradigm. These authors discussed animal communication because this topic elucidates the nature of animals, the differences between man and animals, and the nature of language. In the final section, I show how the novel scientific study of animal communication is exemplified in Wenzel's *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache* der Thiere (1800).

2. Wolff on animals and language

Descartes famously claimed that animals are automata (Harrison, 1992). He also claimed that animals lack language. Descartes provided mechanical explanations of animal abilities that were traditionally explained through the animal soul (Hatfield, 2019). Discussing language, Descartes argued, in his *Discourse on the Method*, that animals do not use words nor do they put together signs. This showed, Descartes claimed, that animals lack thought (Hatfield, 2011, p. 407). Descartes stressed the gap between humans and animals further by arguing that although animals may do some specific task very well, such as bees building a honeycomb, they fail at multiple other tasks and thus lack reason, which is a universal instrument that can be used in multiple situations (Hatfield 2019). These arguments show that Descartes' thoughts on animals are related to his thoughts on human nature and the place humans occupy in nature. Descartes' discussion of animals reflects his anthropology.[1] As we shall see, Christian Wolff's discussion of animals and animal language stands in the tradition of Descartes.

In order to comprehend Christian Wolff's conception of animals and language, we may first describe his views on language. Camposampiero (2018, p.117) notes that Wolff conceived of a correspondence between mental operations and linguistic structures: concepts combine to form judgments, whereas words compose sentences (*Sätze*), which are linguistic expressions of judgments. In turn, sentences make up syllogisms, which are expressions of inferences. Importantly, the "basic principle of Wolff's semantics" is the traditional claim "that words are signs of mental contents such as ideas, concepts, or thoughts" (p. 119). According to Camposampiero, words mean, signify or denote concepts or ideas (Camposampiero (2018).

Like Descartes, Wolff tied the question of whether animals have reason to the question of whether they have language. In his *German Metaphysics* (1720), Wolff argued that it is through language that humans use reason (1722, pp. 529–530). He argued that because animals do not have changes in tones of their voice, and no words, animals lack language. From this, he concluded that animals lack reason, arguing that animals lack distinctness in their representations (1722, p. 530). Animals, according to Wolff, possess lower faculties of the soul, such as sensation and imagination (1722, pp. 530–531). These faculties are sufficient to explain all animal behavior. Wolff concluded that although animals lack reason they have an analogue of reason, since with their lower faculties they can perform behaviors that seem to be caused by reason (1722, pp. 531–532).

Wolff's discussion of animals mirrors that of Descartes insofar as his views on animals are also connected to his views on the nature of humans. Wolff assigns animals lower psychological capacities, while attributing higher faculties, such as understanding and reason, to humans. From this it follows, as Wolff explains in his metaphysics, that animals are not spirits (*Geister*) while humans are (Wolff, 1722, p. 548). The reason is that a *Geist* is a being that has understanding and a free will. Since the souls of animals lack understanding and a will, they are, in contrast to the souls of humans, no *Geister*. In this way, Wolff related his discussion of animals to the special status that humans have within nature.

Van den Berg (2018) has argued that Wolff's psychological writings provide a framework that elucidates the views on animal cognition from different authors such as Buffon and Reimarus. In this article, we shall argue that Wolff's attempts to (i) tie the question of animal reason to the question of animal language (like Descartes), and (ii) to attribute animals an analogue of reason because the behavior of animals can be explained in terms of the lower faculties of the soul, constituted a paradigmatic framework within which authors such as Winkler, Meier, and Reimarus conducted their investigations on animals. Not all of these authors agreed with Wolff. However, they all debated the question of animal language within the context of the debate on animal reason and developed their position on animal reason with respect to the idea that animals have an analogue of reason.

3. Animal reason and language in the 1740s: Winkler's *Philosophische Untersuchungen*

In Germany one extensive discussion of questions concerning the animal soul was published in the middle of the eighteenth century by the philologist Johann Heinrich Winkler (1703-1774) (Ingensiep 1995, p. 105). In his *Philosophische Untersuchungen von dem Seyn und Wesen der Seelen der Thiere* (1745), Winkler published collections of essays from 1742 to 1745 on the question of the existence of animal souls. These collections were the result of interdisciplinary symposia held in Leipzig in the 1740's (Ingensiep 1995, p. 105), and were translated in Dutch in the 1770s (I have consulted the Dutch translation). As Ingensiep notes, in the conclusion to the third volume of his collection, Winkler concluded that animals do not only have souls, but also have the capacity to reason. According to Winkler, this conclusion followed, among others, from the geometrical precision with which animals build their homes, and from the provisions that animals make with respect to the future (Winkler, 1773, pp. 65–66). The problem of animal language was discussed in the context of the debate surrounding animal reason. How did the authors publishing in Winkler's collection define reason and on which basis did they attribute reason and language to animals?

In Winkler's volume, the question of whether animals have reason was preceded by a definition of reason proposed by Christold Mylius. According to Mylius, an animal possesses reason if its actions show that the animal is able to *combine* or *connect* two or more judgments (Winkler, 1773, p. 38). Judgments can be connected to one another by showing that one judgment follows from another judgment, or by showing that one judgment makes another judgment comprehensible (Winkler, 1773, p. 38). If an animal merely makes different judgments, without combining them, the animal is said to have understanding and not reason (Winkler, 1773, p. 38). This definition of reason amounted to saying that animals can be said to have reason if they are able to make inferences. On the basis of this definition, the authors who published in Winkler's collection of essays provided four arguments for the existence of animal reason.

3.1. The argument from geometry

Carel Gottlob van Penzig argued that the geometrical precision with which many animals build their nests shows that many animals possess reason (Winkler, 1773, pp. 39–43). Van Penzig (pp. 40–41) referred to the fact that bees construct their cells in accordance with geometrical rules, probably referring to what is now known as the honeycomb conjecture (Mancosu 2018; Van den Berg, 2014, p. 44). According to this

[1] I am thankful to an anonymous referee for stressing this point. See on this topic also De Fontenay (1998).

conjecture, the hexagonal structure of the cells of the honeycomb provided the mathematically optimal means to construct a honeycomb (Mancosu 2018). According to van Penzig, the fact that bees constructed their cells in accordance with geometrical rules provided evidence for the fact that the bees were able to combine geometrical propositions. The same reasoning was applied to other species of animals (Winkler, 1773, pp. 41–42).

3.2. The argument from foresight

A second argument for the existence of animal reason was given by Johann Christian Körner. According to Körner, the provisions that animals make for the future show that animals are able to combine judgments, and thus are able to reason (Winkler, 1773, pp. 44–48). For example, in the summer ants gather an amount of food that is supposed to last them through the winter (pp. 44–46). The manner in which ants collect their food is conducted with a great amount of *knowledge* and *foresight* and this provided evidence for attributing reason to ants.

3.3. The argument from morality

A third argument for the existence of animal reason was articulated by Ernst Christian Wagner. According to Wagner, animals performed *moral acts*, such as the care bestowed on their young. Since, in the case of humans, we often take reason to be the cause of moral acts, we should, by analogy, also infer that reason is the cause of the moral acts of animals (Winkler, 1773, 49–56).

3.4. The argument from language

The fourth argument for the existence of animal reason was formulated by Fredrik Hendrik Wagner. According to Wagner, the tones that animals emit during their lives provided evidence that they possess *language*. Since language is indicative of possessing reason, i.e., of the possibility to combine different thoughts and judgments, animals must also possess reason (Winkler, 1773, 57–64).

According to Wagner, the sounds that animals emit are used to express desires and are used to facilitate the communication of desires to conspecifics. For example, a clucker that finds corn will emit a sound that attracts young chicks to the site where the corn is to be found (Winkler, 1773, p. 58). For Wagner, this example clearly shows that animals are able to communicate desires. Wagner acknowledged that animal language is simpler than the language possessed by humans (Winkler, 1773, pp. 58–59). Nevertheless, this is no argument against the claim that animals have a language, since the sounds emitted by animals and the behavior that these sounds elicit provide clear testimony of the fact that animal language exists.

Wagner's method was anecdotal: anecdotes concerning animal behavior were cited that were best explained by positing the existence of animal language. Wagner did not compare human language with animal languages, and hence the nature of animal language was left in the dark. The language of animals was only discussed in order to prove that animals have reason.

According to the authors who published in Winkler's collection of essays, many supposedly uniquely human characteristics were also possessed by animals. This did not entail that there are no differences between humans and animals. None of these authors denied, for example, that the language of humans is more rich and complex than animal language. To do justice to these differences, Winkler concluded that animals seem to have a *degree* of reason (Winkler, 1773, p. 65).

4. Meier and Reimarus on degrees of reason and animal language

If the difference between man and animals is one of degrees, how can we make this difference precise? This question was tackled by Georg Friedrich Meier in his *Versuch eines neuen Lehrgebäudes von den Seelen der Thiere* (1749). In this work, Meier gave a precise classification of the different degrees of reason that exist. On the basis of this classification, he determined which degree of reason can be attributed to animals. Meier's attribution of a degree of reason to animals was criticized by Reimarus in his *Allgemeine Betrachtungen über die Triebe der Thiere* (1760). In this section, we will look into the debate between Meier and Reimarus.[2]

Meier provided a classification of different degrees of reason on the basis of the distinctions between, on the one hand, clear and obscure representations, and, on the other hand, distinct and confused representations. According to Meier, representations can be either clear or obscure. If we are conscious of the object of this representation, i.e, if we are able to distinguish this object from other objects, the representation is called clear (Meier, 1749, pp. 65–66). If we are not conscious of the object of this representation, i.e., if we cannot distinguish this object from other objects, the representation is obscure. A clear representation is either distinct or confused. If we are conscious of the parts of a clear representation, this representation is called *distinct* (Meier, 1749, p. 67). If we are not conscious of the parts of a clear representation, this representation is called *confused*.

On the basis of these distinctions Meier, following Wolff (Van den Berg, 2020, p. 37), proposes a distinction between two faculties of cognition. One the one hand, we have a lower or sensible faculty of cognition, which produces obscure or clear but indistinct representations (Meier, 1749, p. 69). The senses pertain to this lower faculty of cognition, insofar as they provide us with obscure or clear but indistinct representations of objects. On the other hand, we have a higher faculty of cognition, called the understanding. It is the understanding which produces *distinct* representations in us (Meier, 1749, pp. 69–70).

There are several degrees of understanding. Meier explicates the first degree of understanding by noting that we are often conscious of multiple representations at once. The complex of representation of which we can at once be conscious is called the field (*Feld*) of representations. If the field of representations is distinct, i.e., if we have clear representation of the parts of this field, this distinctness is due to what Meier calls the first degree of understanding (Meier, 1749, pp. 70–71). Meier gives the following example: If I stand upon a hill and can discern, for instance, a village, a forest, and a river, I will have a distinct representation of my (visual) field. This distinct representation is due to the first degree of understanding. According to Meier, many animals possess the first degree of understanding (Meier, 1749, pp. 76–77). For example, hounds used for hunting often pursue one particular deer that was chosen at the beginning of the hunt. This shows that the hound has a clear representation of the deer and is able to distinguish this representation from other representations. Hence, the dog has multiple clear representations, i.e., his field of representations is distinct, and can be assigned the first degree of understanding.

If my field of representation is distinct, and I also have some distinct representations of the clear representations that make up this field, we have achieved a second degree of understanding (Meier, 1749, p. 71). If I stand upon a hill and discern a village, a forest, and a river, and can also discern the parts of the village, the forest and the river, we are operating at the second degree of understanding. According to Meier, most animals possess the second degree of understanding (Meier, 1749, pp. 78–79). For example, many dogs are able to look their master in the eyes and react in a particular way to their masters gaze. This shows that the dog

[2] See on this debate also Browning (2021) and on Meier and Reimarus Leland (2018), 2020. In contrast to these authors, I pay special attention to the role that language plays in Meier's and Reimarus' accounts of animal cognition. See for a very instructive account of Meier's position and his debate with Johan Jakob Plitt, with special attention to the theological context of this debate and some discussion of both authors' views on language, Nowitzki (2015). In contrast to Nowitzki, I focus on the Meier-Reimarus debate, mainly because Reimarus had a formative influence on the debate of animal reason in the eighteenth century (see, e.g., Zammito, 2018).

does not only have a clear representation of her master, but is also able to distinguish the face of her master from other bodily parts. Hence, the dog has clear representations of the parts of her master and can be assigned the second degree of understanding.

At the third level of understanding, we form universal and abstract concepts. In order to form abstract concepts, we must have clear and distinct representations and we must be able to discern similarities among these representations (Meier, 1749, pp. 72–73). For example, in order to form the abstract concept of a dog, I must have clear and distinct representations of different types of dogs and must have insight into the similarities among different types of dogs. Meier remained agnostic about the question whether animals have concepts or the third level of understanding.

Finally, at the fourth level of understanding we are able to form universal judgments (Meier, 1749, p. 73). The subject and predicate of universal judgments are abstract concepts. Hence, the capacity to form universal judgments presupposes the third level of understanding. However, when forming a universal judgment, my representation of the whole must also be distinct. In particular, in forming universal judgments, we must have distinct insight into relations among abstract concepts. That the comparison of abstract concepts is a prerequisite for forming universal judgments is what leads Meier to assign the capacity to form universal judgments to the fourth level of understanding. Meier again remained agnostic about the question whether animals have the fourth level of understanding.

Reason is a faculty distinct from understanding. Reason is defined as the faculty that provides distinct knowledge of the relations among objects, concepts, or judgments. Meier distinguishes between two degrees of reason (Meier, 1749, pp. 73–74). The first degree of reason is defined as the capacity to know relations among individual objects. If a scientist places a leaf under a microscope and discerns different kinds of relations among its parts, she uses the first degree of reason. The second degree of reason is obtained when we know the relations among universal judgments. This kind of insight is obtained when we are able to deduce judgments from other judgments. Meier assigns animals the first degree of reason (Meier, 1749, pp. 80–81). He cites the case of a cow who, after being fed in a particular stable, constantly tried to enter this stable. This stable was, however, locked by means of a wooden latch. After seeing a milkmaid opening the stable by removing the latch, the cow tried to remove the latch by means of her horns. This example shows, Meier argues, that the cow had a distinct representation of how the stable was locked. It could distinguish the door of the stable and its many parts, and was able to discern how the stable door was locked by means of a wooden latch.

Can we attribute universal concepts and judgments to animals (the third and fourth level of understanding), and can we attribute the second level of reason to animals? According to Meier, the behavior of animals provided too little evidence to settle these questions (Meier, 1749, pp. 85–88). He noted that many behaviors of animals could be explained by attributing the second level of reason to them. Thus, Meier cited the hoarding behavior of hamsters as a behavior that seemed to presuppose a certain amount of foresight on the part of the animal (Meier, 1749, p. 86). The animal knows that there will be a time in which food will be scarce and may possibly *infer* from this that it is necessary to store a certain amount of food. Although this animal behavior can be explained by attributing to them the second level of reason, we cannot rule out alternative accounts of this behavior. For example, the hoarding behavior may also be due to a mere mechanical instinct (Meier, 1749, p. 88). On the basis of the observation of hoarding behavior, there is no way to choose between the hypothesis that hoarding is the result of rational inference or the hypothesis that hoarding is the result of a mechanical instinct. In short, many of the complex behaviors of animals can be explained in terms of low-level cognitive mechanisms. Hence, these complex behaviors do not necessitate the attribution of reason to animals. However, it is important to emphasize that from this it does not follow that animals lack reason. We must simply remain agnostic on this point. Meier stressed his agnostic stance throughout his work (see e.g., Meier, 1749, pp. 105–106).

Meier concludes his discussion of animal reason by discussing the question of whether animals possess language (Meier, 1749, pp. 100–101). He notes that Descartes argued that since animals lack language, although they do possess organs for speech, they must lack reason. Meier rejects this argument. He notes that lack of language does not imply lack of reason. A mute is unable to articulate words, yet nobody would infer from this that the mute lacks reason (Meier, 1749, p. 101). In addition, Meier noted that we can view language as either a necessary aid for reasoning, or we might view language as a non-necessary aid for reasoning. Humans reason through language, however, Meier argues that one cannot infer from this that language is necessary for reasoning: such an inference would be anthropocentric (Meier, 1749, pp. 101–102). Hence, Meier severed the necessary connection between language and reasoning that was so evident for authors such as Descartes and Wolff. Meier further argued that we should not restrict the term 'language' to human languages. A language is defined as a set of signs that express thoughts. It would be anthropocentric to argue that human languages exhaust the set of signs that can express thoughts. It is conceivable, Meier argues, that animals use tones, gestures, or movements of their limbs as signs in order to communicate with one another (Meier, 1749, p. 103). Finally, Meier stated that the number of signs is irrelevant to the question of whether some signs constitute a language (Meier, 1749, p. 104). Hence, we cannot point to the complexity of human language and compare it to the simplicity of animal communication to deny animals language. Meier even conceives of an animal language as a language that contains signs that do not refer to *concepts*, and is thus less complex than human language, but that nevertheless enables animal communication (Meier, 1749, p. 104). To conclude: Meier rejected anthropocentric reasoning that took human language as a standard in order to deny animals language and had a flexible and broad conception of language that allowed for the possibility that languages exist that do not refer to concepts. It followed that animals might have language.

Meier's attribution of degrees of understanding and reason to animals was rejected by Reimarus in his *Allgemeine Betrachtungen über die Triebe der Thiere* (1760) (Browning, 2021). Reimarus' position on animal behavior has been extensively discussed (Jaynes & Woodward, 1974a, 1974b; Richards, 1987; Zammito, 2018; Van den Berg, 2018, 2020; Leland, 2020). Characteristic of Reimarus' position is that he denied that animal behavior can be explained mechanically. All animal behavior must, Reimarus argued, be explained by certain innate drives or instincts, a class of which were called *Kunsttriebe*. These drives explained, among others, the artful constructions of animals, such as bees building a honeycomb. Hence, one did not need to attribute reason to animals in order to explain these artful constructions (see Jaynes & Woodward, 1974a, 1974b; Richards, 1987; Zammito, 2018; Van den Berg, 2018, 2020; Leland, 2020). According to Reimarus, the behavior of animals is imperfectible, whereas the higher faculties of humans, including reason, allowed for learning and perfectibility (Browning 2021). Hence, as was the case for Descartes and Wolff, Reimarus' views were again closely tied up with his anthropological views.

For our present purposes, we can refer to van den Berg's 2018 account of Reimarus' theory to describe why Reimarus rejected Meier's theory. According to Van den Berg, 2018, Reimarus argued that animals exhibit behavior that may lead us to think they have reason, such as the ability to categorize objects. However, such behavior can be explained in terms of low-level cognitive mechanisms. For example, categorization in animals can according to Reimarus be explained as follows:

> Individual objects belonging to the same species have identical attributes. The sensible impression of individual objects belonging to the same species will, because they share attributes, be similar. This explains how animals categorize objects on the basis of *sensations* alone, and not, like humans, on the basis of concepts. Let me give an idealized example: confronted with two humans and two cats, a dog

> will be confronted with something like the following complexes (unique confused mixes!) of sensible impressions (impressions of attributes in bold): $human_1$ [A, B, **C, D, E,** F]; $human_2$ [G, H, **C**, **D**, **E**, I]; cat_1 [J, K, **C**, **L**, **M**, N], cat_2 [O, P, **C**, **L**, **M**, Q]. Similarity of sensations, and not concepts, thus allow animals to categorize humans and cats: $human_1$ and $human_2$ are similar sensible complexes (more similar, say, then $human_1$ and cat_1) and hence they elicit one kind of response of the animal (the same holds for cat_1 and cat_2). (Van den Berg, 2018, p. 5)

Hence, low level cognitive mechanisms allow us to explain categorization in animals and accordingly animals lack reason although they possess an analogue of reason (Van den Berg, 2018, p. 7). In this respect, Reimarus position was similar to that of Wolff (section 2). Reimarus rejected Meier's contention that animals have degrees of reason and argued that animals and humans are categorically distinct. What distinguishes humans from animals is the fact that humans, but not animals, are able to form concepts, judgments, and (syllogistic) inferences. As Van den Berg (2018) explains, Reimarus adopted a conceptualist position:

> In order to have clear thoughts, we must be able, as Reimarus puts it, to recognize the abstracted and universal knowledge of similarities and differences in the individual thing. But having abstract and universal knowledge of similarities and differences amounts to having concepts. Hence, Reimarus argues that having clear thoughts requires the application of concepts. Reimarus notes that if a man stands upon a hill and discerns, for example, a village, a forest, and a river, the man will have *concepts* of a village, a forest, and a river. It is because the man has the concept of a village, the concept of a forest, and the concept of a river, that the man is able to form clear representations of the village, the forest, and the river. (Van den Berg, 2018, pp. 6–7).

It follows that even the lower degrees of understanding and reason that Meier attributed to animals, such as having a distinct representation of a visual field, require the application of concepts. But animals do not have concepts, and accordingly it is wrong to attribute any degree of understanding or reason to animals (Reimarus, 1762, pp. 264–268. See also; Browning, 2021).

Reimarus' position also implied that animals lack language. Since animals cannot abstract, they must lack language, or so Reimarus argued (Reimarus, 1762, p. 50). Reimarus explained that since animals lack concepts they must lack words, since words refer to concepts or, as Reimarus puts it, abstracted similarities (1762, p. 267). Hence, Reimarus adopted the traditional conception of language that was adopted by Wolff (section 2) and used this conception to deny that animals have language.

For Meier and Reimarus, the communication of animals was not an independent research topic, but was discussed in order to decide whether animals have reason. What distinguished the positions of Meier and Reimarus was (i) a broad versus a narrow conception of language and (ii) the inclination to judge animal communication by the standards of human language. Meier adopted a broad conception of language insofar as he allowed for the possibility of a language that did not refer to concepts, a position that implied that animals could possess a language. Reimarus adopted a narrow conception of language as a collection of signs that partly refer to concepts and denied that animals could have a language. Reimarus accordingly also judged the language capacities of animals in terms of human language (a complex collection of signs that partly refer to concepts), whereas Meier insisted that it is anthropocentric to use human language as a standard in terms of which we judge the communication methods of animals.

5. French debates on animal cognition and animal language

We have seen that animal communication was studied for large parts of the eighteenth century in Germany because the question of animal language was tied to the debate on animal reason. Many theorists we have discussed, such as Wolff, Winkler, Meier, and Reimarus, were concerned with the question of whether animals possess reason, and although they made sporadic remarks on animal language it is difficult to find in these authors a sustained systematic investigation of animal language or communication. In the next sections, I wish to argue that this situation changed in the second half of the eighteenth century, and that this change was in part due to French debates on animals and the origin and development of language.[3] Within the French context, animal communication was studied not only in relation to the debate on animal reason but also because this topic elucidates the origin and development of human language, a question that was widely discussed in the 18th century (Lifschitz, 2012). In the remainder of this paper, I will argue that interest in animal communication became natural for authors in the second half of the eighteenth century because of three interrelated developments: (i) the rise of linguistics as an independent study of language, (ii) the rise of anthropology, and (iii) the rise of biology as an autonomous science around 1800.

5.1. Rousseau, condillac and Süßmilch on animals and animal language

Lifschitz (2012, p. 171) has argued that the problem of the origin and development of language became central to anthropology since the 1760s. According to Lifschitz, debates about animal cognition and language were interrelated within anthropology in this period (see also Zammito, 2002, pp. 244–245). Süßmilch, for example, who we will discuss below, published his lectures on the divine origin of language in 1766 and included an appendix on animal language, arguing, like Reimarus, that animals lacked abstract ideas and therefore language (Lifschitz, 2012, p. 171.). Hence, animal language was a core topic of anthropology in the second half of the eighteenth century. Moreover, investigations into the human-animal boundary were essential to anthropology in the late eighteenth century (Zammito, 2017). Reflections on animal languages illuminated this boundary and it is thus no surprise to see an increasing interest in animal language in this period. In the present section, we will see how debates on the origin and development of language impacted anthropology by discussing the works of Rousseau, Condillac, and Süßmilch.

Rousseau thematized animals and the human-animal relation in his *Discours sur l'origine et les fondements de l'inégalité parmi les hommes* (1755). As Inston (2019) remarks, Rousseau posited a continuity between animals and man, even entertaining the idea that man descended from apes (2019, p. 38). This continuity was apparent by the fact that all animals were subject to certain types of instincts, namely: self-love (the instinct for self-preservation) and pity (repulsion at suffering) (Inston, 2019, p. 39). According to Inston's reading of Rousseau, man differed only in degree from animals (p. 41). This difference was partly due to language, which allows humans to obtain purely intellectual ideas. In addition, whereas animals are governed by instincts through which they are adapted to the environment, human beings "are distinguished from animals by their perfectibility, the almost unlimited freedom to change for better or worse. All other creatures, Rousseau conjectures, are endowed with instincts appropriate to their self-preservation. By contrast, humans lack any internal mechanism which determines their behaviour. Perfectibility designates our potentiality, our freedom to be always other then we are". (2019, p. 43). As we shall see in the following, Herder and Tetens would later also argue that human beings are perfectible beings.

Next to thematizing the human-animal relation, Rousseau also investigated the origin of language. In the second *Discourse*, Rousseau questioned how language could be originally formed and how primitive tribes could give names to universals (Bertram 2020). In his unpublished *Essay on the origin of languages* (c. 1753–1761), as Bertram 2020 explains, Rousseau again took up the question of the origin of language. He argues that humans wish to communicate as soon as they recognize others as

[3] For discussion of French debates on animals, see also De Fontenay (1998).

beings of the same species (Bertram 2020). Language, rather then gesture, is needed for this since language enables the communication of the passions in a way that gesture does not (Bertram 2020). For this purpose, the tone and stress of communication are crucial. Early vocabulary was figurative and words only later acquired a literal meaning (Bertram 2020). Hence, the question of the origin of language continued to concern Rousseau throughout the course of his career.

Condillac also contributed greatly to the debate on animal cognition in eighteenth-century France (Richards, 1979; Van den Berg, 2020). As Richards has explained, in his *Traité des animaux* (1755) Condillac posited a continuity between humans and animals, attributing animals a degree of reason. Arguing that all mental operations, including reason, derived from sensation, granting animals sensation meant granting animals reason, Condillac thought (Richards, 1979, p. 91). By attributing animals reason, Condillac rejected the idea that animals were governed by blind instinct. According to Condillac, instincts were acquired habits. Animals exhibit the same habits because they are governed by the same limited needs (Richards, 1979, p. 91).

Throughout his career, Condillac also wrote on the question of the origin and development of language, and he linked this discussion to the phenomenon of animal language. As Falkenstein & Grandi, (2017) explain, Condillac, in his *Essay* (1746), distinguished between accidental, natural and instituted signs. Accidental signs are signs that are often encountered in conjunction with an object. Natural signs are the signs that are instinctively produced when we have a particular experience. When we produce a sign intentionally to communicate and produce a certain thought, we use instituted signs (Falkenstein & Grandi, 2017, §6). We develop language by progressing to instituted signs. This is done by creating a language of action, which is "a language composed of cries and gestures culled from natural language. A spoken language of arbitrary sounds and a written language are then gradually invented by users of the language of action" (Falkenstein & Grandi, 2017, §6). In his *Traité des animaux* (1755), Condillac linked the question of the development of language to the idea of animal language. Falkenstein & Grandi, put the point as follows:

> In later works (*Treatise of Animals* [1755], *Grammar*, part of the *Course of Study for the Prince of Parma*, [1768], and *Logic* [1780]), Condillac explained more clearly the transition from a language of natural signs to the language of action made up of institutional signs. […] He explicitly distinguished two types of "language of action." The first one is "natural" (and thus appears to correspond to the use of natural signs also described in the *Essay*). Its signs depend on the conformation of the organs (*Treatise of Animals* II. 4, *Grammar* I.1, *Logic* II.2). As a consequence, different species of animals have a different natural language insofar as they have different organs (*Treatise of Animals* II.4). This language is innate in its expression since different signs are naturally caused by different ideas independently of any learning. However, the interpretation of this language is not innate: we have to learn to interpret its signs (*Grammar* I.1, *Logic* II.2). (Strictly speaking, cries, facial expressions, and gestures are signs only insofar as we interpret them: before any interpretation they are just the effects on our body of some ideas occurring in our minds.) The second type of language of action is institutional or artificial. Condillac makes clear that its signs are artificial but they are not arbitrary (*Grammar* I.1). They are not arbitrary because they are chosen according to a rule of analogy with the natural signs (*Grammar* I.1, *Logic* II.2). (Falkenstein & Grandi, 2017, §7)

Hence, Condillac granted animals a type of language, and used his reflections on animal language to explain the origin and development of human language, which he explained as a transition from a natural language to an institutional language.

The French discussion on the origin and development of language impacted German debates in the eighteenth century. Süßmilch's *Versuch eines Beweises, daß die erste Sprache inhren Ursprung nicht vom Menschen, sondern allein vom Schöpfer erhalten habe* (1766) also took up the question of the origin and development of language, and in this work Süßmilch reacted to Rousseau's *Discours* (Lifschitz, 2012, p. 83). Süßmilch's main thesis in this work, as Lifschitz explains (2012, p. 84), was that on "the one hand, language was the sole means for the exercise of higher mental operations, while on the other, its structure must have required deliberate design by a fully rational mind. Hence language could not have been formed by man, the only alternative being a superior entity whose intellect did not depend on the use of signs".

In an appendix to his *Versuch*, Süßmilch considered the question of animal language. He remarked that some philosophers attributed language to animals and erased all the differences between man and animals. Süßmilch vehemently argued against this position. He argued that although animals used tones, and although one can even say that they used such tones as signs (e.g., for warning), it is wrong to attribute language to animals since once cannot maintain that animal tones are arbitrary and changeable, as is the case for the tones of human language (1766, p. 100). In contrast to human language, which is learned, arbitrary and changeable, the tones of animals are innate and necessary (1766, p. 100). Süßmilch further argued that animal tones do not possess the multiplicity and complexity of human language. From the fact that the tones of animals are uniform and always the same, Süßmilch concluded that animal language, if one can speak of animal language at all, is very simple, in contrast to human language (1766). Finally, Süßmilch argued that animal languages did not possess words, including count words, and hence also no concepts and no reason (1766, pp. 100–101).

Süßmilch's *Versuch* shows how the debate on the origin and development of language was taken up in Germany and how this debate was connected to the question of animal language. Animal language was discussed because it allows us to understand the origin and development of language and because it was an essential question for determining the human-animal boundary. Hence, animal language was an important topic within anthropology in the second half of the eighteenth century.

5.2. Buffon on birdsong

Smith (2017) has provided an illuminating discussion of birdsong from Aristotle to the modern period. Birdsong was a means of animal communication and insofar life scientists studied birdsong they studied animal communication. As Smith explains, many naturalists from antiquity onwards recognized that birdsong was learned and argued that if birdsong is learned birds learned something language-like (2017, p. 129). In this section, we will discuss the reflections of the famous French naturalist Buffon on birdsong in order to demonstrate that eighteenth-century life scientists were actively engaged in the study of animal communication (see on birdsong in Buffon also Bewell, 2003).

In his first volume of *The Natural History of Birds* (1770), Buffon wrote a general introductory chapter on the nature of birds. Here, he discussed the different senses of birds, their behavior, including for example their migration during the winter, and their physical characteristics. One topic that was extensively discussed was birdsong, or the nature of communication among birds. Buffon remarked that we "perceive with what facility they retain and repeat tones, successions of notes, and even discourse; we delight to listen to their unwearied songs, to the incessant warbling of their happy love." (Buffon [1770] 1793, p. 9). This led to a discussion of the organs by means of which birds could communicate. Buffon further noted that the sweetness of voice and melody of song are partly natural, partly acquired (Buffon [1770], p. 13). Birds can copy from each other and even from humans, which explains how birds learn to communicate among each other (Buffon [1770], p. 13). This explained the complicated communication of birds in populous and developed countries. Finally, Buffon remarked that the communication methods of birds, he did not use the term language, are expressions of the passions of birds (Buffon [1770]., p. 15). Thus, bird tones express fear, danger, sweet desire, and so forth.

Buffon's discussion shows that animal communication was discussed by life scientists in the eighteenth century. Animal communication was simply a feature of animal behavior that should be studied by naturalists and was therefore taken up by Buffon in his natural history. With the increase of attention for biological studies at the end of the eighteenth century, we may expect more attention for studies of animal behavior and animal communication. In the final section, we will provide evidence for this fact when discussing the work of Wenzel, who, among other things, attempted to provide biological explanations of the how a multiplicity of animal languages could have arisen.

6. Herder and Tetens on animal language

Having discussed the topic of animal language within the French context, we may now consider how this topic was dealt with in late eighteenth-century Germany. In his 1772 treatise *Abhandlung über den Ursprung der Sprache*, Herder explicated the differences between human and animals in a manner that closely resembled that of Reimarus. Indeed, Förster (2010) describes Herder's views on animals in 1772 as essentially the same as those of Reimarus, whereas Zammito (2017) sees Herder's treatise on the origin of language, building on Reimarus, as an attempt to properly explain animal instinct as opposed to the mere description of animal instinct that Reimarus had given. That Herder's position of animals, as articulated in his 1772 essay, is close to that of Reimarus is clear from the claim "[…] that the human species does not stand above the animals in *levels* of more or less, but in *kind* (Herder [1772] 2002, 81). Hence, like Reimarus Herder took there to be a categorical difference between animals and humans. As Forster (2010) has shown, Herder argued that reflection and concepts cannot be attributed to animals and are unique to humans (2010, pp. 97–98), that animals lack something akin to human language (Forster, 2010, pp. 97–98), and that since human sensations depend on concepts and language, the sensations of animals (who lack concepts and language) are different from those of humans (who have concepts and language) (Forster, 2010, pp. 97–98). All these positions we have also found in Reimarus, so there are good reasons for positing continuity between the views of Reimarus and Herder.

However, the similarities between Herder and Reimarus disappear when we consider the topic of animal language. Herder adopted the idea that animals lacking reason and concepts did have the capacity to possess a language, whereas Reimarus denied the attribution of any type of language to animals. In the first section of his *Abhandlung*, partly following the lead of Condillac, Herder affirmed that each animal species has a distinctive language. Thus, Herder started his treatise by noting that as an animal, the human being has language ([1772] 2002, p. 65). Animal language was an expression of the lively sensations and passions that animals possess ([1772] 2002, pp. 65–66). The cries of passions or sensations of animals served a linguistic communicative function, insofar as they are directed toward the "expression to other creatures" ([1772] 2002, p. 66) Herder stated that "*these groans, these sounds, are language. Hence there is a language of sensation which is an immediate law of nature*" ([1772] 2002, p. 66). This language was designed to receive sympathy and was understood by members of a single species: "*May your sensation resound for your species in a single way, and therefore be perceived by all, as by a single one, with sympathy*" ([1772] 2002, p. 66). Humans had an artificial language that was completely different to this animal language and Herder stipulated: "*the less human nature is related to an animal kind, the less similar it is to the latter in nerve structure, then the less the latter's natural language is intelligible to us*" ([1772] 2002, p. 67). Next to stating that animal languages are barely intelligible to us, Herder compared the properties of animal languages with the properties of human artificial language, and noted the former did not refer to things whereas the latter did: "This tiring breath, the semi-groan, which dies so movingly on the lip distorted by pain-separate it from all its living helpers and it is an empty blast of air […] It was supposed to sound, not to depict!" ([1772] 2002, p.68). Herder also stated that animal language is not used with intention, whereas human language is ([1772] 2002, pp. 74–75). Finally, Herder noted that in all original languages, remains of natural sounds remain ([1772] 2002, pp. 74–75). Hence: (a) Herder acknowledged the existence of animal language, (b) argued that animal language served a communicative function, (c) stated that animal language exists even if animals lack reason and concepts, and despite the fact that animal language does not refer to concepts, and (d) compared the animal language with human language, arguing that the latter but not the former allowed for reference and intentionality.

Herder's interest in the origin and development of human language thus led him to investigate animal modes of communication. He took animal communication seriously because animal languages explained the phenomenon of language and he discussed animal communication separately from the question of whether animals have reason. Note that for Herder, animal languages did not explain the origin of human language, since human language is something completely different from animal language and it is not the case that any animal "has the slightest real beginning towards a human language" ([1772] 2002, p. 74). Nevertheless, a proper investigation into the origin and development of language necessitated the study of animal communication. In tying the debate of animal language to the question of the origin of language, Herder positioned himself within the debate on the origin of language, which was conducted by diverse authors such as Condillac and Suβmilch in the eighteenth century (Lifschitz, 2012).

A similar conception of the study of language can be found in the work of Johann Nicolas Tetens. In his *Philosophische Versuche über die Menschliche Natur und ihre Entwicklung* (1777), Tetens considered, like Rosseau and Herder, the human-animal boundary and argued that humans are the most perfectible creatures on earth, i.e., creatures that are not determined at birth and are capable of great development (*Auswicklung*) (Tetens, 1777, pp. 740–741). Humans can adopt any form and possess reason, the capacity for language, and freedom (Tetens, 1777, pp. 740–741). All these characteristics distinguish man from animals, and Tetents developed his position on animals while extensively discussing the positions of Reimarus and Herder (Zammito, 2017). After discussing the animal-human boundary, Tetens considered the question of the origin of language, entering into a debate with Süßmilch and Herder. His main point, as Zammito explains, was that "language creation was contingent upon external circumstances and human community" (Zammito, 2017, p. 140). Although Tetens did not explicitly reflect on animal language in this part of the book, he did conceive of the development of language as a development of "organic tones" that express joy or pain to more complex forms of language that includes words, ideas and concepts (Tetens, 1777, p. 784). Hence, it seems Tetens, like Herder, conceived of animal communications as a language that exists without referring to concepts, i.e., as a non-human (animal) language. For our present purposes, it is important to notice that in the writings of Tetens, the scientific investigation of animals was inextricably bound up with anthropological questions concerning the human-animal boundary and linguistic-anthropological questions concerning the origin, learning and development of language.

In the works of Herder and Tetens, the scientific investigation of animals was thus tied to questions concerning the origin and development of language. In this context, animal communication was not simply studied as something that sheds light on the philosophical question of whether animals have reason. In the period when Herder and Tetens wrote we see a shift towards the idea that animal communication is a subject worthy of scientific study independent of the debate around animal reason. This shift can be connected, as I have briefly stated above, to three developments within the sciences in the late eighteenth century. Let us take a closer look at these developments.

(i) Michael Forster has argued that Herder's works had a significant role in the birth of linguistics, influencing Friedrich Schlegel, and, through Schlegel, Franz Bopp, August Wilhelm Schlegel, Jakob Grimm, and Wilhelm von Humboldt. According to Forster (2019, Supplement), Herder provided the foundations for linguistics by

adopting principles such as (a) "thought is essentially dependent on and bounded by language", (b) meaning consists in word-usages, and (c) "humankind exhibits profound differences in modes of thought, concepts, and language especially between different historical periods and cultures". Principle (c) points towards an increased interest in the origin and historical development of human languages, topics which, as we have seen, were intensively investigated in the later eighteenth century. Hence, we can conclude that through the late eighteenth-century focus on the origin and development of language, language became an important topic of investigation for its own sake. Within this context, it is no surprise to find sustained and systematic discussion of animal language, understood as a mode of communication that informs us on the phenomenon of language.

(ii) Herder is credited by Forster (2019) as a central figure in the birth of anthropology (see also Zammito, 2002). As we have discussed in the previous section, the question of the origin and development of language and the human-animal boundary were crucial topics within late eighteenth-century anthropology. Since reflections on animal languages are important in order to understand these topics we come to see an increasing interest in animal language.

(iii) Finally we may point towards the emergence of biology as a special science to explain the interest for animal communication for its own sake (see on the emergence of biology e.g., Richards, 2002, Zammito, 2018; Van den Berg & Demarest, 2020). In the writings of Buffon, as we have seen in the last section, animal communication was studied. As Zammito (2018, p. 2) makes clear, quoting Thomas Bach, the emergence of the term *Biology* around 1800 illustrates the emergence of an idea of a science of life that concerns itself exclusively with the phenomena of life. In this context phenomena concerning life were studied for their own sake and became increasingly separated from external theological concerns. Thus, Van den Berg (2013) argues that Kant demarcated metaphysical and theological studies from biological research, whereas Zammito (2017) argues that whereas theorists such as Reimarus based animal behavior research on theology, later theorists such as Herder tried to give a naturalized account of animal instincts and behavior. The emergence of animal language as a subject that is to be studied because it elucidates the nature of animals fits this development toward a new autonomous biological science, as we will also see in the next section.

7. Wenzel's *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache der Thiere* (1800)

In the previous sections, I have argued that in the historical period where we witness the birth of linguistics, anthropology, and biology we can also discern an increasing interest in the study of animal language. In this final section, I wish to further support this interpretation by discussing the little known *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache der Thiere* (1800), of the author Gottfried Immanuel Wenzel. This book shows what the study of animal language looks like around 1800.

In his *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache der Thiere* (1800), Wenzel systematically developed the idea that animals lacking reason did nevertheless have a language. Wenzel started his essay by observing that common experience is sufficient to convince oneself that animals have a language. More specifically, animals use tones to express their sensations, states of mind, and passions (Wenzel, 1800, p.21). Thus, for example, a sick and suffering animal whines, wails and moans (Wenzel, 1800, p. 21). The voice of a hen is sweet and mellow when she gathers her children, but full of concern and fear when her ducks move towards the water (Wenzel, 1800, p.23). Observations such as these show that animals have the capacity to make themselves comprehensible through tones, and in this sense have a language. The analogy between animals and man also supported this conclusion, Wenzel believed. Like humans, animals have senses and sensations, experience pleasure and pain, experience desire, and are in the possession of organs that allow them to emit tones (Wenzel, 1800, pp. 23–24). This analogy between the organization of man and animals supports the conclusion that, like humans, animals are able to express and communicate the feelings that they experience, Wenzel believed.

Of course, animal language differed from human language. Man is, according to Wenzel, the most noble of all creatures on earth (Wenzel, 1800, p. 48). Adopting a line of reasoning familiar from Condillac, Reimarus, and Herder, Wenzel argued that man has an inexplicable amount of needs, and constantly forms new concepts and new types of knowledge to satisfy these needs. Human language, Wenzel believed, must be suitable to express this multitude of needs, concepts, and different types of knowledge, and accordingly must be extremely flexible and rich in expressions (Wenzel, 1800, pp. 48–49). This circumstance explains why human language is much more complex and rich than animal language. Animals are more limited in their needs than humans are (Wenzel, 1800, p. 50). They do not have concepts, and do not possess abstract thought or knowledge. Rather, their behavior is limited insofar as they only react to sensible impressions. It follows, Wenzel believed, that animal language is much more simple than human language. Animals only need to be able to express their sensible sensations, desires, or passions, and for this simple tones suffice, as opposed to, for example, articulated words that express concepts (Wenzel, 1800, p. 50). Here we thus see how Wenzel, like Herder, systematically compared animal language with human language, and even tried to explain the differences between these languages. Although animal language is simple, it is sufficient to satisfy the needs of animals, i.e., to express sensible sensations and desires (Wenzel, 1800, pp. 51–52). Hence, Wenzel believed that animal language was perfectly adapted to the needs of animals, just as human language is perfectly adapted to the needs of humans.

The biggest difference between animal and human language, according to Wenzel, was that the latter contains (spoken and written) words whereas the former does not. Accordingly, Wenzelf denied that animal languages are capable of reference (Wenzel, 1800, p. 84). Although words are a species of tones, the tones of animals do not possess the constant and uniform modulation that is characteristic of the words pronounced by humans (Wenzel, 1800, p. 84). The expressions of animals usually consist in a short series of tones, rather than of words. Wenzel proposed that, even if the tones emitted by animals are often chaotic and indiscernible, we can grasp the meaning of these tones by correlating the tones emitted by animals to the passions or emotions that are expressed by the behavior of an animal (Wenzel, 1800, p. 84). Adopting this procedure, Wenzel argued, for example, that monosyllabic and bisyllabic tones are expressions that express carefulness on the part of the animal (Wenzel, 1800, p. 85). All animals that have young, according to Wenzel, emit monosyllabic or bisyllabic tones when humans approach their nests, and he interpreted these tones as warning signs. Sequences of rapidly succeeding tones that contain inharmonious or dissonant tones were taken to be an expression of dissatisfaction or anger of the animal (Wenzel, 1800, p. 85). Watchdogs that spot an intruder were taken to emit such tones, for example. In this manner, Wenzel proposed, we can start to decipher the meaning of animal language.

The idea guiding Wenzel's translations was that animals can express each of their emotions or passions by means of specific tones or sequences of tones uttered in a specific way. Through extensive observation of animal behavior, man should be able to understand the meaning of these tones (Wenzel, 1800, p. 121). On the basis of his observations, Wenzel even proposed to articulate a rudimentary dictionary of the animal languages (Wenzel, 1800, pp. 122–143). This dictionary provided, in effect, a translation of tones and cries uttered by animals into human language. Thus, for example, the tone Aa, uttered by geese, was taken to express danger, whereas the tone Au, uttered by dogs, was taken to express fear or pain. Wenzel's dictionary was ordered alphabetically from A to Z, and was taken to convey the meaning of tones expressed by various

species such as geese, dogs, cats, and apes. The idea to create a dictionary of animal language reflects the idea to study the meaning and structure of animal language and compare it to human language, and thus to explain the phenomenon of animal language for its own sake.

Of course, animals did not have a universal language. According to Wenzel, each different species of animal has its own particular language. He argued for this claim by analogy. Just as there is a great multitude of human languages dispersed across a variety of nations and geographical areas, so too there must be a great variety of animal languages, each language being peculiar to species that occupy a particular geographical area (Wenzel, 1800, p. 98–101). The language of the animal species was taken to be adapted to this geographical area. In particular, the geographical area in which an animal lived was taken to determine the richness and variety of the language of this animal (Wenzel, 1800, pp. 102–103). Thus, for example, the language of the eagle owl, which lives in stone ravines lacking a great deal of variety, was taken to be very simple and devoid of expressive power. Other factors influencing the nature and structure of languages of animal species were taken to consist in (i) the amount of social relations an animal has. The language of social animals was taken to be richer than the languages of animals that live a primarily solitary life; (ii) the nutrition of an animal and the specific enemies an animal has. The language of an animal must be suited to express each animal species' particular forms of nutrition and particular enemies; (iii) the physical organization of the animal (Wenzel, 1800, pp. 103–104). In short, the language of each animal species was taken to be adapted to each animal's physical organization and way of life, and reflected the many environmental factors that influenced the species, such as geographical location and habitat. Hence, Wenzel attempted to produce biological explanations of the variety of animal languages, showing how a variety of animal languages could have arisen.

Although each animal species has a particular language that reflects the environment in which the animal lives, Wenzel believed that there were a limited number of main languages from which other languages were derived. More specifically, the languages of each animal species were taken to be degenerations of a limited number of original languages. These original languages were taken to be common to *families* of animals (Wenzel, 1800, p. 105). Thus, for example the family of horses consisted, according to Wenzel, of six species of horses, e.g., the horse, the wild horse, the mule, and so forth (Wenzel, 1800, pp. 106–107). Each species of horses had its own peculiar language reflecting the specific environmental conditions in which they live. Nevertheless, there were similarities between the languages of these different horses, and these could be explained by treating the languages of each species of horses as degenerations or modifications of a single original language. In this manner, Wenzel attempted to give biological explanations of the evolution of animal languages.

Wenzel concluded his essay on animal language by comparing different forms of animal language. His comparison showed that the differences between animal languages are differences of degrees. As we have already seen, the complexity of an animal language is a function of the needs an animal has: animals that have more needs will have a more complex language than animals that have fewer needs (Wenzel, 1800, p. 190). This idea led Wenzel to argue that there are different levels of perfection of animal languages and to construct a hierarchy of animal languages (Wenzel, 1800, pp. 190–191). Animals that have the fewest needs, such as fish, will have the least complex and least perfect language, whereas animals that have more needs, such as dogs, will have a more complex and more perfect language (Wenzel, 1800, pp. 190–191). In total, Wenzel distinguished between fourteen levels of complexity or perfection of animal languages, ranging from the language of fish to the language of birds, which were taken to have the most complex and most perfect form of animal language. None of these languages came close to reflecting the complexity that was characteristic of human languages. As we have seen, humans, having more needs than any other language, have the most complex languages that exist. However, the difference between animal and human language was, according to Wenzel, one of degree, and accordingly there existed a continuum between the communication methods of humans and of animals.

Wenzel's treatise does not stand on its own. Other works on animal language in this period also illustrate the study of animal languages because of an interest in language and its development. For example, in his *Universalhistorischer Ueberblick der Entwicklung des Menschengeschlechts, als eines sich fortbildenden Gantzen* (1801), an anthropological work, Daniel Jenisch argued that animals possess a language of tones expressing sensations (1801, pp. 9–10). However, animal languages and human languages are very distinct (1801, pp. 10–11). After discussing the differences between animal and human languages, and more generally the human-animal boundary, Jenisch mentioned the theories of Herder, Fulda and Monbodo on the formation, development, and learning of language (1801, p. 14), after which he discussed especially the learning of language. Hence, animal languages were once again discussed in the context of anthropological discussions of the animal-human boundary and theories concerning the origin and development of language, a situation that we have encountered multiple times at the end of the eighteenth century.

8. Conclusion

Wenzel's *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache der Thiere* (1800) exemplifies a new perspective on the study of animal language. Animal languages were not studied simply because they inform us about the existence of animal reason. Like Herder and Tetens, Wenzel argued that animal languages could exist without having words that refer to concepts, systematically compared human languages to animal languages in order to elucidate both types of languages, and tried to explicate the meaning and structure of animal languages. In addition, Wenzel attempted to explain the differences between animal and human languages and tried to provide biological explanations of the evolution of animal languages. All of these endeavors show that animal language was studied because it informs us about animals, about the differences between humans and animals, and about the phenomenon of language. I have argued in this paper that the emergence of this new perspective on animal language around 1800 is no surprise, because it is precisely in this period that we witness, partly due to the influence of Herder, the birth of linguistics, anthropology, and biology as independent fields of scientific investigation. Within this disciplinary context, it is understandable that increasing attention would be devoted to animal language as a worthwhile topic of scientific study. However, this renewed interest in animal language arrived fairly late in the eighteenth century. As I have shown, for large parts of the eighteenth century authors only discussed animal language within the context of the debate surrounding animal reason. It is in the second half of the eighteenth century and through the debate on the origin and development of language, which arrived in Germany through French debates, that this paradigm on animal cognition was abandoned and that an intellectual climate came to exist where animal languages began to be systematically studied for other reasons.

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