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DOI
10.1016/j.shpsc.2018.10.002

Publication date
2018

Document Version
Author accepted manuscript

Published in
Studies in History and Philosophy of Biological and Biomedical Sciences

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Link to publication

Citation for published version (APA):
van den Berg, H. (2018). A Blooming and Buzzing Confusion: Buffon, Reimarus, and Kant on Animal Cognition. *Studies in History and Philosophy of Biological and Biomedical Sciences*, *72*, 1-9. https://doi.org/10.1016/j.shpsc.2018.10.002

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Download date:18 Nov 2026

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This is the accepted author manuscript. The published version is: Van den Berg, H. (2018). A Blooming and Buzzing Confusion: Buffon, Reimarus, and Kant on Animal Cognition. *Studies in History and Philosophy of Biological and Biomedical Sciences* 72: 1-9. https://doi.org/10.1016/j.shpsc.2018.10.002

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A Blooming and Buzzing Confusion: Buffon, Reimarus, and Kant on Animal Cognition

Kant's views on animals have received much attention in recent years. According to some, Kant attributed the capacity for objective perceptual awareness to non-human animals, even though he denied that they have concepts. This position is difficult to square with a conceptualist reading of Kant, according to which objective perceptual awareness requires concepts. Others take Kant's views on animals to imply that the mental life of animals is a blooming, buzzing confusion. In this article I provide a historical reconstruction of Kant's views on animals, relating them to eighteenth-century debates on animal cognition. I reconstruct the views of Buffon and Reimarus and show that (i) both Buffon and Reimarus adopted a conceptualist position, according to which concepts structure the cognitive experience of adult humans, and (ii) that both described the mental life of animals as a blooming, buzzing confusion. Kant's position, I argue, is virtually identical to that of Reimarus. Hence Kant's views on animals support a conceptualist reading of Kant. The article further articulates the historical antecedents of the Kantian idea that concepts structure human cognitive experience and provides a novel account of how the ideas of similarity and difference were conceptualized in eighteenth-century debates on animal cognition.

Keywords: (non-) conceptualism, similarity, animal cognition, Buffon, Reimarus, Kant.

1. Introduction

Kant's views on animals have received increasing amounts of attention in recent times (McLear 2011; Fisher 2017). The reason why his views on animals are much discussed is the debate between conceptualist and non-conceptualist interpretations of Kant (see Hanna 2017 for an overview of the debate). According to conceptualists, objective perceptual awareness requires conceptual capacities or the application of concepts. According to non-conceptualists, objective perceptual awareness requires only the sensory capacity for awareness of particulars, perhaps along with some minimal kind of cognitive processing (McLear 2011, p. 1). The question is whether Kant is a conceptualist or not.

A challenge for the conceptualist is that we might be inclined to attribute objective perceptual awareness to non-human animals and human infants, even though they lack conceptual capacities. McLear develops this interpretation and argues that Kant attributed objective perceptual awareness to animals, even though he denied them concepts, a position that does not square with a conceptualist interpretation of Kant. According to McLear, conceptualists have two ways to interpret the mental life of animals. On the first option, non-discursive beings "are conscious merely of their own sensations, which in the absence of rule-giving conceptual articulation are liable to be experienced, in James's memorable phrase, as a blooming, buzzing confusion" (McLear 2011, p. 3). On the second option, the proponent of conceptualism entirely denies "to non-discursive beings the capacities for both objective perceptual awareness and mere sensory awareness" (McLear 2011, p. 4). McLear argues that both positions do not fit the position of Kant and that there is space in Kant for a position that allows for objective conscious awareness without being conceptual in nature.

McLear's position has recently been criticized by Fisher (2017). Fisher argues that according to Kant all representations of animals are obscure, i.e., they are representations of which they are not conscious (Fisher 2017, p. 444). Moreover, she argues that the mental life of animals is characterized by disunity. More specifically, she argues that according to Kant animals lack a unified consciousness (Fisher 2017, p. 451). This interpretation is supported by Kant's claims such as the following:

Animals will have no general cognition through reflection, no identity of the representations, also no connections of the representations according to subject and predicate, according to ground and consequence, according to the whole and according to the parts; for those are all consequences of the consciousness which animals lack (Kant 1902, *Ak* 28, pp. 276-277).

Hence, according to Fisher, Kant's views on the mental life of animals come close to describing the mental life of animals as a blooming and buzzing confusion.

Which one of these interpretations is correct? Both Mclear and Fisher provide excellent arguments but focus solely on Kant's own statements on animals, which are scattered across his writings and lecture notes. What is

currently lacking is a historical embedding of these statements within eighteenth-century biological debates on animal cognition. In this paper my aim is to relate Kant's views on animal cognition to eighteenth-century debates on animal cognition, and in particular to the views of Buffon and Reimarus. I argue that Kant's views on animals were hardly original, for they are virtually identical to the views of Reimarus, who in turn adopted some (but not all) ideas of Buffon. In particular, I show that (i) Buffon and Reimarus adopted a conceptualist position, according to which concepts structure the experience of adult humans, and (ii) that Buffon and Reimarus described the mental life of animals as a blooming and buzzing confusion. Since Kant's position is virtually identical to that of Reimarus, Fisher's interpretation of Kant, who takes Kant to argue that all animal representations are obscure, is correct. Against McLear, we show that Kant describes the mental life of animals as a blooming and buzzing confusion and that his views on animal cognition support rather than discredit a conceptualist reading of Kant.

My historical reconstruction aims to make two more historical contributions. First, Kant is often credited as one of the first philosophers who made the claim that concepts structure human (perceptual) experience. The historical antecedents of this idea are little known. I show that in their discussion of animal cognition, both Buffon and Reimarus argued that concepts structure human experience. Indeed, one of the main differences between animals and humans was taken to be that the cognitive experience of humans was structured by concepts, whereas the cognitive experience of animals was not. Hence, eighteenth-century biological debates on animal cognition provide one of the possible sources for the idea that concepts structure human experience.

Second, by analyzing Buffon, Reimarus and Kant I show that one of the boundaries between non-human animals and humans was taken to lie in the fact that animals do not have clear and distinct cognition of similarities and differences between (represented) objects. Hence, although the possession of concepts was taken to signal a clear difference between humans and animals, the fundamental difference between animals and humans was taken to be based on a more fundamental contention: animals cannot, in contrast to humans, clearly and distinctly cognize similarities and differences. This fact explains why the mental life of animals is best described as a blooming and buzzing confusion. This article provides a novel history of how the ideas of similarity and difference were conceptualized in eighteenth-century debates on animal cognition, a topic that has received little to no attention.

When discussing the similarities between three authors (Buffon, Reimarus, and Kant), the questions arises whether we are dealing with a genuine historical influence between these authors or if there are only similarities (analogies) between their views.[1] Establishing a genuine historical influence of Buffon and

[1] I am grateful to an anonymus referee for pressing me to make this point explicit.

Reimarus on Kant is difficult because Kant's oeuvre does not contain passages that mention Buffon and Reimarus explicitly while also discussing their views on animal cognition. I have chosen to discuss Buffon because Buffon's views on animal cognition had an impact on Reimarus, as Zammito has recently established (Zammito 2018, p. 136). In a paper that puts Reimarus central stage Buffon is thus a good place to start. I will further argue that there is quite some indirect evidence that makes it *probable* that Kant was familiar with the writings of Reimarus. However, even if we cannot establish the influence of Reimarus on Kant with complete certainty, I hope to show that discussing Kant in the context of Buffon and Reimarus provides fruitful insights into the philosophy of Kant, such as evidence for a conceptualist reading of Kant and the fact that Kant's views on animal cognition are highly similar to those of Reimarus.

The structure of this article is as follows. In Section 2, I discuss how the ideas of similarity and difference are used in present day debates on concept learning in animals. This exposition provides a model for interpreting the views of Buffon, Reimarus, and Kant, who also took similarity and difference to be key concepts in debating the cognitive capacities of animals. Section 3 provides a historical reconstruction of the views on animals of Buffon. I analyze Buffon on the basis of an exposition of the psychological views of Christian Wolff and show that Buffon denied animals the capacity to clearly cognize similarities and differences. I further show that human representations have, according to Buffon, conceptual content whereas animal representations do not. Section 4 and 5 provide a historical reconstruction of the views on animal cognition by Reimarus. I describe Reimarus' views on the cognitive capacities of animals on the basis of the psychological writings of Wolff, and attribute to Reimarus a conceptualist position according to which objective perceptual awareness of objects requires the application of concepts. In section 6 I show that Kant's views on animal cognition were virtually identical to those of Reimarus. I argue that Kant's views on animals imply that the mental life of animals is a blooming and buzzing confusion and that these views provide support for a conceptualist reading of Kant.

2. Present Day Animal Cognition: Concept Learning in Animals

Locke famously claimed that nonhuman animals do not have the power to abstract and form concepts. The capacity to form concepts provided a perfect distinction between nonhuman animals and humans. Times have changed. Present day comparative psychologists argue that several of the major varieties of conceptual classes (concepts) claimed to be uniquely human are also exhibited by nonhuman animals (Zentall et al. 2008). Zental et. al. distinguish between perceptual classes, associative classes, and relational classes (Zental et al. 2008). According to Zental et. al, experimental research supports the view that animals have the ability to use all three classes (Ibid, p. 14).

Objects pertaining to *perceptual classes*, also called basic-level categories, are taken to involve stimuli that share certain characteristics, such as all *cats* or all *cars* (ibid, p. 15). The capacity for obtaining such concepts might perhaps be explained in terms of an inborn capacity to determine *perceptual similarities* (ibid, p. 17). The members of *associative classes* do not, as in the case of perceptual classes, share common characteristics. As an example, Zental et. al. mention the class consisting of a chair, the spoken word chair, and the written word chair. Here: "the basis for the common response to members of the class is arbitrary and associative" (ibid, p. 19). Finally, relational classes also do not depend on perceptual properties of stimuli, but involve relationships among stimuli (ibid, p. 25). Sometimes relational classes are simply called abstract (as opposed to non-abstract or natural) concepts (Katz & Wright 2006). Within comparative psychology, important relational classes include *sameness* and *difference* (Wasserman & Young 2010; Katz, Wright & Bodily 2007).

As is clear from the above account, the capacity to observe perceptual *similarities* (in the case of perceptual classes) and the capacity to cognize abstract relational classes such as *sameness* and *difference* figure heavily in present day debates on concept learning in animals. In this paper, I want to show that debates concerning the capacity to cognize *similarities* and *differences* were also central to eighteenth-century debates on animal cognition. Although the authors I discuss followed Locke in arguing that animals lack concepts, their reasons for doing so were based on a more fundamental contention: that animals do not have clear perceptual or abstract knowledge of similarities and differences. According to Buffon animals lack knowledge of similarities and differences because they lack the power to reflect, whereas Reimarus argued that clear knowledge of similarity and difference requires the application of innate abstract and relational concepts such as sameness (which animals lack). The third author I will discuss, Kant, adopted the position of Reimarus. These authors thus denied, in contrast to present day researchers, that animals have clear cognition of *perceptual* similarities and differences or of *abstract relational concepts* of sameness and difference. The perfect distinction between animals and humans was taken to lie in the capacity to cognize similarities and differences.

3. Animal and Human Psychology in Buffon

In his *Histoire Naturelle*, Buffon wrote a polemical text, entitled "Dissertation on Animals, that confronted the defenders of animals' souls, i.e., those who "humanized animals by giving them an intelligence and human feelings that they do not have" (Roger 1997, p. 240) In the "Dissertation on Animals", as well as in the text "Homo Duplex", Buffon vehemently denied the existence of animal reason. This belief was based on the observation of nature, which shows that all the operations of animals proceed in a relatively *uniform* way. Buffon argued that the

uniformity of animal behavior indicated the absence of reason, for if animals have reason, we would observe a large amount of variety, improvement, or perfection in their work, as is the case for man (Buffon [1753] 1785, p. 236). In addition, the uniformity of animal behavior suggested that it was the result of "pure mechanism" (ibid, p. 294). Hence, animal behavior can be explained purely mechanically and does not require attributing reason to animals.

What, according to Buffon, are the fundamental *psychological* differences between humans and animals? In his dissertation, Buffon strictly distinguishes sensations from ideas, and argues that animals have *sensations* but no *ideas* (Buffon [1753] 1785, p. 238). Animals lack ideas because they lack *reflection* and the faculty to *compare sensations* (ibid. cf. Buffon [1753] 1785, p. 249, 258). Buffon argues that through comparing sensations humans obtain *particular ideas*, and by comparing *particular ideas* humans obtain *general ideas* (Buffon [1753] 1785, p. 262). In short: animals differ from man because they cannot reflect on or compare sensations and consequently lack ideas (whether particular or general).

These remarks raise multiple questions. What is the exact difference between sensations and ideas? What is so special about ideas? And, what is the relation between comparison, reflection, and ideas? It is difficult to definitively link Buffon's remarks to some philosophical tradition. The Cartesians, with the possible exception of Malebranche (Nadler 1992), did not always strictly distinguish between sensations and ideas. Buffon is often regarded as a follower of Locke, but Locke also did not always strictly distinguish sensations from ideas.

In the following, I will explain Buffon's remarks using the psychological writings of Christian Wolff and, to a lesser extent, by referring to ideas of Leibniz. The rationale behind this approach is that the works of Wolff we can find clear answers to all of the interpretative questions posed above. Sloan has argued that Wolff's philosophy, whose works were known in France through, among others, Voltaire and Madame du Châtelet, exerted a significant influence on Buffon (Sloan 1979). My analysis can be taken to support this claim. However, Buffon was clearly influenced by multiple authors, including Cartesians, Locke, Leibniz, and many others. Moreover, Wolff's philosophy and psychology itself incorporated many Cartesian and empiricist elements. My aim is thus not primarily to argue for a specific influence of Wolff on Buffon, but to sketch a theory of psychology that was widely influential in the eighteenth century and that makes sense of Buffon's remarks.

Let us start with Buffon's strict distinction between sensations and ideas. A strict distinction between *idea* and *sensation* can be found in the encyclopedia of Diderot and d'Alembert (published, to be sure, after the texts of Buffon we are considering). In the entry on "sensation" (1765), the anonymous author, criticizing Locke, notes that ideas are *clear*, i.e., they *distinctively* "evoke in us some object that is not us" (Anonymous 1765). By contrast, sensations are *obscure*, they do not *distinctly* show us any object, and *confused*. The confused nature of sensations is linked to the idea that sensations are complex: they consist of parts.

The author cites Newton's prism experiments to support her view. These experiments showed that there are "only five basic colours", and that other colors are complexes made up from basic colors (Ibid). Sensations are structured similarly: sensations of complex colors, which we believe are simple, are actually complexes of *small perceptions* (of basic colors), which the mind cannot distinguish from one another. This explains why sensations are confused.

For our purposes, it is important to note that this is a *Leibnizian* idea. Simmons has shown that Leibniz thought that sensations are composed of *petit perceptions*, and hence are confused in the sense that they do not represent what they seem to represent (Simmons 2002). The Encyclopedie article thus illustrates the impact of Leibnizean ideas in eighteenth century France. But how should we precisely understand the distinction between sensation and idea? My reading is that ideas represent objects in a strong sense, or, using contemporary terminology, that these representations have conceptual content (Siegel 2016). An idea of, say, an elm represents the elm *as* an elm (it represents the elm as an instance of a general category). This is the point of calling ideas *clear*. By contrast, though sensations are representations, they do not represent objects in this strong sense and are confused. The details of this picture will become clear if we turn our attention to Wolff.

In all of his writings, Wolff analyzes complexes into their parts. This procedure allowed him to give definitions of *clarity* and *distinctness*. For example, in his logic Wolff construes concepts as complexes of parts (van den Berg 2014). The concept *man* is composed of the genus *animal*, the differentia *rational*, and so forth. A concept is *clear* if we recognize the things to which it applies (e.g., if we correctly identify Plato, Linneaus, etc., as *man*). If a concept is not clear, it is *obscure*. A clear concept is *distinct* if we can know its marks or parts, e.g., *animal* in the case of *man* (Wolff [1712] 1978, pp.126-129).

In Wolff's empirical psychology, the same analysis is applied to *thoughts*. Thoughts allow us to be conscious of objects outside of us (Wolff [1719] 2003a, p. 108). A thought is clear if we know *what* we think, and if we can *distinguish* what we think from other things (ibid., p. 110). For example, if we clearly see a house, i.e., if we know *that* it is a house and can *distinguish* it from other things, we have a clear thought (ibid). Hence, if we have clear thoughts we represent in the strong sense indicated above: we represent a house *as a* house. If a thought is not clear, i.e., if we do not know *what* is represented, it is obscure (e.g., the perception of "something white"; Wolff [1719] 2003a, p. 111). Finally, a thought is distinct if we can specify how the thing that we think of differs from other things. This is possible if we know its parts. For example, we have distinct thoughts of 'triangle' and 'square' if we can distinguish them by specifying that a triangle is composed of three lines and a square of four (Wolff [1719] 2003a, p. 115).

How do we obtain clear thoughts? For Wolff, clarity arises through recognizing *differences* between things (ibid, 112). More specifically, we have a clear thought of object A, i.e., we represent object A *as* A, if we can determine

similarities and *differences* between A and other objects. Obtaining clear thoughts thus requires *comparison* between objects. This reading is suggested by the claim that sensations are transformed into thoughts through *reflection* and *memory* (Wolff [1719] 2003b, pp. 467-468). For Wolff, *reflection* enables *comparison*: reflection allows us to focus on the parts of a thing and compare it with its other parts. We reflect, for example, on an elm if we focus on its trunk, leaves, and so forth, and compare these parts. Through reflection we thus obtain *distinct* cognition of a tree (Wolff [1719] 2003a, p. 272). If we are engaged in this process, *memory* enables us to know that the parts of an object we now perceive resemble the parts of an object we have previously perceived. Hence, Wolff concludes that reflection and memory allow us to determine *similarity* (*Ähnlichkeit*) and *differences* between objects (ibid., p. 273). This cognition is necessary for having clear thoughts. Finally, it is important to note that in the Wolffian tradition *ideas* of particular things were treated as *concepts* (see Reimarus 1762, p. 35). Concepts thus include both general concepts, i.e., a *notio* such as *man*, and *ideas* as representations of particulars (Wolff [1712] 1978, p. 123; Wolff [1728] 1983, p. 127).

Although Wolff does not make this inference explicit, it follows that if we deny reflection or the capacity to compare to animals they cannot have clear thoughts, i.e., they cannot clearly know *what* is represented by a representation and cannot clearly see similarities and differences between a represented object and other objects. This seems to be the position of Buffon. As we have seen, Buffon argues that *comparison* or *reflection*, providing knowledge of similarities and differences, is necessary to obtain ideas, and that the capacity for comparison or reflection is uniquely human (Buffon [1753] 1785, p. 249, 261-262). Since Buffon denies the capacity of comparison or reflection to animals, it follows that animals do not have clear knowledge of similarities and differences between objects. In contrast to modern researchers, Buffon thus does not think animals have a clear knowledge of perceptual similarities and differences. Buffon's thoughts imply that the knowledge that animals have of objects is confused: they cannot clearly differentiate between different represented objects. James' characterization of animal life as a blooming and buzzing confusion thus seems entirely appropriate to describe Buffon's views on animal life. Only if we have knowledge of similarities and differences, and only if we can abstract and categorize these similarities and differences, can we form concepts and represent objects conceptually, i.e., can we represent some object A as A. Since animals lack clear knowledge of similarity and differences, however, animals also lack concepts. This is one of the main implications of Buffon's claim that animals lack ideas.

The reading I have developed is supported by Buffon's treatment of animal perception. Buffon compares animal perception, constituted solely by *sensations*, with the perception of mad man and humans immersed by passions, i.e., with people who do not reflect nor employ ideas (ibid, pp. 250, 254-255). Such people are "out of theirselves". They are "immersed in actual sensations" which can be

"violent, rapid, and leave the mind no leisure to reflect", so that they do not know anything but only "feel it" (Ibid, pp. 254-255). In other words, people who do not reflect do not know *what* their sensations represent, i.e., they have no clear thoughts and cannot clearly determine similarities and differences between objects. The life of people who do not reflect is, once again, a blooming and buzzing confusion. The same is true for the mental life of animals. This life must be contrasted with the mental life of humans who reflect and employ concepts. Humans with concepts have clear thoughts of objects, i.e., they clearly know the similarities and differences between represented objects and they represent objects conceptually as instances of general categories.

We can further support the present reading of Buffon by considering his views on memory. According to Buffon, animal memory is fundamentally different from human memory, i.e., animals do not have memory proper. Buffon argues that human memory originates from the faculty of *reflection* and includes the idea of *time*, which is itself acquired through reflection (ibid, p. 251, 261). According to Buffon, then, human memory is made possible through the application of *concepts*. Since animals lack concepts, they do not have clear thoughts about what happened in the past and do not possess genuine memory. The knowledge animals have of the past is fundamentally confused.

Buffon's thoughts on memory become clearer if we consider the views of Locke. In the *Essay*, Locke argued that *duration* and *time* originate from sensation and *reflection*. If we reflect on the train of distinct ideas in our mind, we obtain the idea of succession, and the perception of distance between successive ideas provides us with the idea of duration. By observing appearances at regular and equidistant periods, e.g., the revolutions of the sun, which provide us with a *constant* alteration of ideas, we obtain ideas of measures of duration, such as minutes, hours, and so forth. Finally, by mentally adding these measures we obtain temporal ideas such as tomorrow, a year, eternity, and so forth (Locke 1690, pp. 408-446). To have temporal ideas thus requires heavy mental machinery: reflection and ideas (concepts) of succession and duration. Animals have none of these ideas or concepts, and hence Buffon concludes, e.g., that birds have no idea of the future or of the past (Buffon [1753] 1785, p. 298). Importantly, human memory employs temporal ideas or concepts. Buffon makes this explicit by noting that we have little recollection of our childhood, which is explained by the fact that children lack the temporal concepts required for memorizing events (Buffon [1753] 1785, p. 253). It is only after children have acquired temporal concepts that they start to remember things.

Buffon further notes that if humans, like animals, have sensations which are "unaccompanied by ideas", e.g., extreme pains and pleasure, our remembrance is *indistinct*: we "cannot figure either the species, the degree, or the duration of those feelings which have affected us so powerfully" (ibid., p. 252). If our memory is distinct we do know these things, i.e., we know *what* we experienced, its intensity (*how* we experienced it), and for *how long* we experienced it. Buffon's

concept of memory thus somewhat resembles our modern concept of episodic memory, i.e, memory of what happened, where it happened, and when it happened (Tulving 1972). Although Buffon denies that animals have such a memory, since they lack ideas or concepts, they do have *reminiscence*, which is explicable in terms of the action of the brain. Reminiscence is merely a renewal or renovation of "the vibrations of the inner sense" (Buffon [1753] 1785, p. 235), a mere *association* of impressions or sensations retained in the inner sense. This mechanical memory is sufficient to explain all the actions of animals that lead us to attribute memory to animals.

To conclude: what distinguishes animals from humans is that the representations of humans have conceptual content. Since humans, as opposed to animals, can *compare* things (reflect on things), they can spot similarities and differences between things and form ideas or concepts. Ideas or concepts, in turn, structure human cognitive experience, as we have seen in the case of human memory. The upshot of this line of reasoning is that the cognitive lives of humans are fundamentally different from the cognitive experiences of animals.

4. Reimarus on Animal and Human Cognition

In the previous section we have seen how Buffon drew the human-animal boundary. In this and the following sections, we will discuss how the human-animal boundary was drawn by Hermann Samuel Reimarus, who wrote one of the more influential works on animal instinct in the late eighteenth century.

Reimarus, who was Professor of Hebrew Oriental Languages at the academic Gymnasium of Hamburg, was as internationally renowned scholar. In 1754, he published his *Die Vornehmsten Wahrheiten der Natürlichen Religion*, followed by his logic, the so-called Vernunftlehre, in 1756. In 1760 he published a work on animal instinct, the *Algemeine Betrachtungen über die Triebe der Tiere* (hereafter: *Triebe*). The latter works were translated in multiple languages and went through many editions. In his *Triebe*, Reimarus developed his fullest account of animal behavior and cognition. He agreed with Buffon that animals lack reason. However, he denied that animal behavior could be explained mechanically. Instead, he thought that animal behavior must be explained by positing certain fundamental innate drives (Jaynes & Woodward 1974a; Lötzsch 1979; van den Berg 2013).

Reimarus' classification of animal drives or instincts has received a lot of attention (Jaynes & Woodward 1974a, 1974b; Lötzsch 1979, Zammito 2018, pp. 134-142). Less well known are his views on the cognitive capacities of animals and his comparison between the cognitive capacities of animals and humans. It is this topic that I will discuss in the following. Reimarus discusses the cognitive faculties of animals in chapter 2 of his *Triebe*. One of the most distinctive features of this chapter is that Reimarus applies Wolff's psychology to the animals. He also

consistently explains the behavior of animals in terms of low-level cognitive mechanisms, reasoning that if the behavior of animals can be explained in terms of low-level cognitive mechanisms we need not attribute higher cognitive capacities (such as reason) to animals. In the following, we will discuss the different cognitive capacities that Reimarus discerns in animals and how they compare to human cognitive capacities.

The first psychological faculty Reimarus discussed in the second chapter of his *Triebe* was that of *attention* (*Beachtung*). Humans perceive complexes, i.e., we perceive a multitude of objects at the same time, though we are not conscious of all these objects. Attention allows us to *isolate* and *focus* on a single object and become aware of it (Reimarus 1762, pp. 17-18). According to Reimarus, the movements of animals towards specific items, the turning of their heads, and so forth, suggested that animals have attention.

Reimarus next discussed imagination. Imagination *renews* and *connects* past representations with present representations. More specifically, imagination (involuntary) *associates* a representation that we have had in the past with a present representation (ibid., 19-20). Wolff explained this process in terms of the following rule of association (*Regel der Einbildungen*): if a part of a present sensation is a part of a past sensation, we imagine the past sensation. Thus, if I have seen Sarah in building x and in the company of y & z yesterday, I will imagine x, y, and z when I see Sarah today (Wolff [1719] 2003a, p. 132). According to Reimarus, the fact that horses enter a hostel because of the food they have previously received there, that dogs are afraid of sticks that they have been beaten with, and so forth, shows that animals have imagination (Reimarus 1762, p. 20).

Like Wolff, Reimarus believed that association (imagination) can explain most animal behavior. Hence, higher cognitive faculties need not be attributed to animals. Reimarus argued that animals use low-level cognitive mechanisms such as imagination to perform complex tasks such as categorizing objects, whereas humans employ reason or understanding to perform such tasks. This meant that the cognitive faculties of animals and humans were *analogous* because they allow for performing the same tasks, but it did not imply that the cognitive capacities of animals and those of humans differed only in degree and not in kind.

Why did Reimarus explain complex animal behavior in terms of low-level cognitive mechanisms? Reimarus adopted the rule that one should judge animals on the "animal state of humans", and he used human children as a model for discussing animal cognition (Reimarus 1762, p. 25-26). Reimarus introduced this rule after criticizing researchers who used analogies between the behavior of adult humans and animals to attribute complex cognitive abilities to animals. These researchers reasoned, for example, as follows: animals categorize objects, humans categorize objects using concepts, hence animals have concepts. Such inferences are problematic, since we can explain animal behavior more parsimoniously in terms of low-level cognitive capacities. Moreover, the analogy between children and animals is apt, since animals and children resemble each

other more than animals and functioning adult people. The fact that animal behavior was modeled after the behavior of prereflective children provided another reasons for explaining animal behavior in terms of low-level cognitive mechanisms.

In our animal state, Reimarus argued, we are unable to remember the past as being in the past. In this state, past representations are mixed with present representations and past and present are indistinguishable. Hence, the animal state is literally a confused mix of (past and present) representations. Once again, animal life can be understood in James' terms as a blooming a buzzing confusion.

The confusion of past and present representations happens in adult humans, for example, when we feel affection for a certain person because she resembles another person we know. This state is taken to be common to animals and children. Reimarus concluded from this that animals and children lack genuine *memory*, which is described as a capacity that allows us to consider the past *as* past, and as different from the present (Reimarus 1762, p. 26-27). Here, Reimarus again followed Wolff, who defines memory, in contradistinction to the imagination, as a faculty that allows us to know reflectively *that* we have previously had a thought (Wolff [1719] 2003a, p. 139). Like Buffon, Reimarus thinks this kind of explicit memory presupposes reflection and the application of *concepts* and pointed to the fact that we have no recollection of our childhood years to support the fact that children (and thus animals) lack genuine memory (Reimarus 1762, pp. 28-29).

Although animals lack genuine memory, they do have imagination. Imagination explains why animals behave *as if* they have memory (ibid., p. 29). For example, the imagination of a dog will unconsciously mix present representations of its master (her smell, looks, etc.) with representations of previous acts of kindness (resulting in a confused unique mix of representations). This allows the dog to recognize her master and to continue to seek her company. Such behavior seems to support the attribution of memory to the dog. However, it can be explained merely in terms of the associations of the imagination. The imagination of the dog is *analogous* to human memory, but nothing more.

Reimarus also invoked imagination to explain how animals *discriminate* individual objects. The imagination of the dog literally *mixes* present sensation of its masters smell, looks, with similar previous sensations, resulting in *one* complex and confused yet *unique* representation, which is not occasioned by other people (Reimarus 1762, p. 31-32). The dog thus discriminates unique complexes, such as [Smell of A at T_1, Look of A at T_1, Smell of A at T_2, petting of A at T_2, etc.], from other complexes.

Animals are also able to *categorize* objects, i.e., to distinguish species and genera (ibid., 33).[2] Humans categorize objects on the basis of concepts, but

[2] My use of the term catgerization is not meant to imply that Reimarus attributed catgeories to animals. It merely means that animals can distinguish between objects of different kinds. This use of the term categorization is similar to how contemporary comperative psychologists use the term.

Remarus believed that the discriminatory capacities of animals need not be explained by attributing concepts to animals. To explain categorization in animals, Reimarus invoked the concept of an attribute, which is a *necessary and essential property* of kinds of things (Wolff [1730] 2001, pp. 120-126). 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$_2$).

What *empirical evidence* did Reimarus invoke to deny animals concepts? He provided a stock example: hens do not have a concept of an egg because they cannot discriminate a piece of chalk from an egg, evidenced by the fact that they brood on chalk (Reimarus 1762, p. 37). This example shows, according to Reimarus, that if different objects occasion *the same sensible impressions* in animals, the animals will treat these objects as being the same (ibid., p. 33). He concluded that animals act on sensible impressions only and do not employ concepts. The idea that Reimarus seems to employ here is that having a concept permits different responses to identical stimuli (Allen & Hauser 1991). Allen and Hauser have recently argued, like Reimarus, that being able to discriminate things does not provide proof for having concepts. Rather, having a concept "permits different response to identical stimuli" (cited in Andrews 2016). For example, ants recognize dead conspecifics on the basis of stimuli of oleic acid, but do not have a concept of death since their behavior is mediated *only* by stimuli of oleic acid (Allen & Hauser 1991, p. 231). Humans, however, employ *multiple* stimuli as evidence for death and can *modify* what counts as evidence for treating something as dead. According to Allen & Hauser, this flexible behavior is accounted for by having concepts: humans have a concept of death because they "have an internal representation of death that is distinct from the perceptual information that is used as evidence for death" (Ibid). Concepts abstract away from perceptual features, and this allows for flexible behavior. Reimarus reasoned in a very similar manner.

5. Reimarus on Concepts and the Conceptual Structure of Experience

Shetlleworth notes that animals categorize complex stimuli if "they give one response to some stimuli and different responses to others" (2010, p. 167).

In section 3, we have seen that Buffon argued that animals, as opposed to humans, do not have experiences with conceptual content. We have further seen that within the Wolffian philosophy to have a concept of A entails that we represent A *as* A. Moreover, having concepts presupposes the faculty of reflection or comparison. In his *Triebe*, Reimarus adopts this Wolffian picture. He argues that in order to have concepts, i.e., to know *what* we represent, we must *compare* individual objects and obtain knowledge of *similarities* and *differences* between objects (Reimarus 1762, p. 35). Knowledge of similarity is, however, a form of universal knowledge (*allgemeines Erkenntnis*). Animals do not have this type of knowledge, and hence they cannot have concepts.

Reimarus' argument is very brief and gives rise to multiple questions. Why do concepts necessarily involve knowledge of similarity and difference? Why is knowledge of similarity a form of universal knowledge? What is, exactly, knowledge of similarity and how is it obtained? To answer these questions, we must consider Reimarus' views on the formation of concepts articulated in his logic or *Vernunftlehre* (1755). By doing so, we will understand why Reimarus argues that knowledge of similarity is itself a form of universal and conceptual knowledge, and can thus not be ascribed to animals.

In his logic, Reimarus provides an extensive account of concept formation. This account runs as follows (Reimarus 1766, pp. 23-34): in order to obtain concepts, humans require, firstly, healthy sensory organs that obtain impressions of external objects. This provides humans with *indistinct* impressions of all the objects that affect their organs. Through *attention* we subsequently focus on a single object or part of our perceptual field (e.g., the letter A). When attending to a single object, *imagination* and *memory* provide us with representations of past objects that are similar to the object we presently perceive (e.g., other letters). After this, we *reflect*, i.e., we *compare* the present and past objects, in order to determine whether these objects are *similar* or *different*. Importantly, Reimarus argues that this requires that we apply abstract metaphysical principles: *the principle of identity* and the *principle of non-contradiction*. It is only after this reflective process, that we properly have a *sensation* of the similarities and differences between things. We can then combine similar things (e.g., various A's), distinguish them from different things (e.g., B's, C's, etc.), and obtain *one* representation of similar things. We then, finally, assign words or signs to this representation, and became conscious of *what* it represents, i.e., we have obtained a *concept*.

Notice that knowledge of similarity and difference is essential to forming concepts. If we have a concept, i.e., if we have *any* representation of some A as A, we are aware of similarities and differences. Thus, for example, having a concept of this letter B involves having knowledge of the similarities between this letter B and other letters B. Knowledge of similarity and difference is not, however, something that is *given* through the senses. In fact, Reimarus says that we only

have a proper *sensation* of similarity after a process of reflection (ibid., p. 30). Hence it seems to be the case that we only have a proper sensation of similarity, i.e, we only perceive *that* object x is similar to y, after we apply concepts: cognition of similarity presupposes conceptual structuring.

We can understand these strong claims if we consider the notion of similarity that is invoked. According to Wolff, two things are *similar* if that which determines their kind is the *same*, and they are different if this is not the case (Wolff [1719] 2003a, p. 10). Thus, for example, we know that two humans are similar because certain properties they have are the same. To obtain this knowledge, we must be able to *abstract* such properties and apply the principles of identity and non-contradiction, leading to judgments such as "a and b are *the same* with respect to y" (and hence similar). This explains why Reimarus thinks that knowledge of similarity is abstract or universal knowledge: it is knowledge that (i) is literally abstracted through a process of comparison or reflection, and (ii) involves the application of the abstract and relational concept of *sameness*. In other words, we need to possess the concept of sameness, and be able to apply it, in order to obtain knowledge of similarity and difference, and hence to obtain any other concepts. The upshot of this discussion is that Reimarus must be committed to a rather strong form of nativism: the concept of sameness must be innate to the mind. Indeed, Reimarus concludes his discussion in his *Triebe* by claiming that humans and children have an innate capacity, called reason, that allows them to understand, without any instruction and learning, the "universal in the individual" and to gain universal knowledge of similarity and difference (Reimarus 1762, pp. 46-47).

It follows that Reimarus denies, in contrast to present day researchers, that animals have clear cognition of perceptual similarities and differences. Such knowledge is not given through the senses, but requires the application of concepts. Hence, it is only through the application of innate concepts that humans have clear cognition of similarities and differences and can differentiate between objects. It is the fact that humans have concepts that explains why the mental life of adult humans is not a blooming and buzzing confusion of representations (as is the case for animals).

To be sure, we have seen in the previous section that Reimarus attributed to animals an obscure and confused *sensible* representation of similarity. This corresponds to what Wolff, in his empirical psychology, calls the identity of sensations (Wolff [1732] 1968, p. 50): the same or similar objects provide the same or similar impressions. However, according to Reimarus similar impressions taken by themselves are obscure and confused. Hence, the cognition of similarity that animals have is obscure and confused as opposed to the clear and distinct knowledge of similarity that humans have. In other words, similar impressions are not sufficient for us to know *that* objects are similar or different. Such cognition requires that we reflect on or compare objects and apply the principles of identity and non-contradiction.

To conclude this section, we may consider Reimarus' conceptualism. In his debate with Meier, who argued that animals have a degree of reason in his *Versuch eines neuen Lehrgebäudes von den Seelen der Thiere* (1749), Reimarus argued that humans only have clear thoughts, i.e., know *what* they represent, if they have abstract and universal knowledge of similarities and differences (Reimarus 1762, p. 268). 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. To substantiate this claim, Reimarus finally refers to research performed by the English surgeon William Chesselden. (ibid). Chesselden performed surgery on a blind boy who suffered from cataract. After the surgery the boy could see, but was, using Reimarus' terminology, unable to have clear representations of individual objects. For example, the boy could not make judgments of distances and thought that all objects touched his eyes. The morale that Reimarus draws from this story is that perception alone does not enable humans to clearly recognize objects for what they are. It is only after humans have formed concepts of individual objects that we are fully able to have clear representations of objects and are able to tell what objects our representations are representations of. Hence, Reimarus adopted a strong conceptualist position.

6. Kant on Animals, Similarity and the Conceptual Structure of Experience

Was Kant aware of developments in eighteenth-century biological debates on animal cognition? We know that Kant was familiar with some of the writings of Buffon, since he gave a course called "Physical Geography" that closely followed the path taken by Buffon in his natural history (Mensch 2013). Moreover, throughout the published writings of Kant there are numerous references to Buffon's work (see for a reference to Buffon's species concept Kant 1902-, *Ak* 2, p. 115). However, there are no passages in Kant that directly discusses Buffon's views on animal cognition, so Kant's familiarity with these views remains uncertain.

There is more evidence that Kant was familiar with Reimarus' writings, although the evidence is often indirect. Kant knew Reimarus' *Die Vornehmsten Wahrheiten der Natürlichen Religion* (1754), a work which he praised in the *Critique of Judgment* (Kant 1902-, *Ak* 5, p. 476), and there are references to

Reimarus' writings on logic in his published writings (Kant 1902-, *Ak* 2, p. 191). With two possible exceptions, there are, as far as I know, no references to Reimarus' *Triebe* (1760).[3] Nevertheless, Reimarus *Vornehmsten Wahrheiten* (1754), which Kant knew, contained a chapter on animal drives or instincts. This suggests that Kant was familiar with the basics of Reimarus' views on animals. In addition, Kant's personal library contained a copy of Reimarus' *Anhang von der verschiednen Determinationen der Naturkräfte, und ihren mancherley Stufen, zur Erläuterung der zehenten Capitels* (1762).[4] This was an appendix to Reimarus' (second edition of the) *Triebe*, which contained an explanation of the basics of Reimarus' theory of drives and, importantly, the denial that animals possess concepts (Reimarus 1762, *Anhang*, p. 44). This also provides evidence for the fact that Kant was familiar with Reimarus' views. Kant also certainly knew Reimarus indirectly. In his *Philosophische Versuche* (1777), which Kant read, Tetens discusses Reimarus' views when discussing animal souls (Tetens 1777, pp. 742-752). Finally, there is some important terminological evidence. In the *Religion Innerhalb der Grenzen der bloßen Vernunft* (Kant 1902-, *Ak* 6, p. 28), Kant uses the term *Kunsttrieb* to designate animal instincts, a term that was, as far as I know, introduced in the philosophical vocabulary by Reimarus. Kant's lectures on anthropology also contain many references to instincts or drives that may be traced to Reimarus, such as the claim that we have an instinct for propagating the species (Kant 1902-, *Ak* 25, p. 614). As we shall see in the following, there is more evidence to suggest that Kant was familiar with Reimarus' views on animals.

A core feature of Reimarus' theory of animal cognition was, as we have seen, his attempt to explain complex animal behavior in terms of low-level cognitive mechanisms. Thus, for example, Reimarus argued that animals use low-level cognitive mechanisms such as imagination to perform complex tasks such as categorizing objects, whereas humans employ reason or understanding to perform such tasks. This meant that the cognitive faculties of animals and humans were *analogous* because they allow for performing the same tasks, but it did not imply that they were of the same kind.

Kant adopted this same line of reasoning and connected it with the idea that complex animal behavior can be explained in terms of instinct. In his *Critique of Judgment* (1790), Kant noted that the ground of the 'artful' constructions of animals, such as the dams and lodges of beavers, was *instinct*, which produces effects or products that are similar to the products of human reason. Since animal instinct produces similar effects as human reason does, i.e., certain products of art, animals can be said to have an analogue of reason, although we cannot attribute reason itself to animals. As Kant puts the point:

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[3] The academy editors thought that Kant was familiar with Reimarus' *Triebe*. A passage in Kant's lectures on metaphysics in which Kant discusses Reimarus is related to the *Triebe* (Kant 1902-, *Ak* 29, p. 934) and a passage in Kant's lectures on anthropology is related to the *Triebe* (Kant 1902-, *Ak* 25, p. 1194).

[4] http://publish.uwo.ca/~cdyck5/UWOKRG/kantsbooks.html.

Thus, in comparing the artistic actions of animals with those of human beings, we conceive of the ground of the former, which we do not know, through the ground of similar effects in humans (reason), which we do know, and thus as an analogue of reason, and by that we also mean to indicate that the ground of the artistic capacity in animals, designated as instinct, is in fact specifically different from reason, but yet has a similar relation to the effect (comparing, say, construction by beavers with that by humans). (Kant 1902-, *Ak* 5, p.464).

Kant thus adopted a position that was virtually identical to that of Reimarus.

Kant also adopted the view, which we have distinguished in both Buffon and Reimarus, that the representations of animals are obscure (Kant 1902-, *Ak* 7, p. 135). This suggests that Kant denied that animals have clear thoughts, i.e., thoughts through which we clearly know *what* is represented. This reading is confirmed by the fact that Kant sometimes explains what it means to have obscure representations by noting that if one has obscure representations one is not conscious of them (Kant 1902-, *Ak* 25, p. 479). Fisher (2017, p. 454) has explained what Kant means with consciousness here. In a *Reflexion* Kant states: "To be conscious of a representation is: to know that one has this representation, i.e.: to distinguish this representation from the other" (Kant 1902-, *Ak* 16, p. 80). Hence, if one has obscure representations, i.e., if one is not conscious of this representation, we lack insight into similarities and differences between objects. By describing the representations of animals as obscure Kant thus clearly adopts a position similar to Reimarus and Buffon. Animals lack clear thoughts, i.e., through their representations they do not know *what* they think and they cannot *distinguish* what they think from other things. The key difference between animals and humans is once again the lack of clear insight into similarities and differences in animals. This lack of insight explains why the mental life of animals is obscure, i.e., why it is a buzzing, blooming confusion.

Kant does not, however, appear to deny animals all insight into similarity and difference. We can deepen our understanding of Kant's views on similarity and difference if we consider his logic lectures. In the *Vienna Logic*, Kant distinguishes the following degrees of cognition:

1. The lowest degree is to represent something. When I cognize that which relates to the object, I represent the object.
2. To cognize, *percipere*, is to represent something in comparison with others and to have insight into its identity or diversity from them. To cognize something with consciousness, then. For animals also cognize their master, but are not conscious of this.
3. To understand something, *intelligere*, to cognize something in the understanding, not merely with consciousness. The understanding is the faculty of concepts.

   To cognize something through concepts, then, is to understand something, *concipere*. (Kant 1902-, *Ak* 24, pp. 845-846).

Animals clearly represent objects (the lowest degree of cognition) but do not cognize through concepts. What about the second level of cognition, i.e., the level of *percipere*? Kant claims that to cognize something with *consciousness* is to have insight into identity or diversity, i.e., into similarities and differences between objects. Kant argues that animals cognize objects but without consciousness, which suggests that they have some kind of cognition of similarity and difference but are not conscious of similarity and difference.

This position, in my view, is a nice restatement of Reimarus' views on similarity and difference. Recall that animals, according to Reimarus, have an obscure sensible representation of similarity and difference. Thus, to repeat my earlier 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 necessary 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]. It is on the basis of this confused cognition of similarity that animals categorize objects. However, this confused cognition of similarity is quite different from the clear and explicit knowledge that humans have of similarity and difference: humans clearly recognize that an object x is similar to object y and different from object z. They have abstract universal knowledge of such facts and can often specify the marks that distinguish objects from one another. Hence, we may conclude with Kant that animals have a confused sensible cognition of similarity but are not conscious of this.

Kant's views on similarity and difference are thus very similar to those of Reimarus. In section 5, we have seen that Reimarus also adopted a conceptualist position. He argued that in order to have clear thoughts, i.e., to know clearly *what* is represented, humans must apply concepts. Moreover, the mental life of humans is characterized by the conceptualization of experience whereas animal experience is not conceptually structured. Can such a conceptualist position be discerned in Kant's remarks on animals? In a 1789 letter to Marcus Herz, Kant argues that without the conditions of the understanding, which include the concepts of the understanding, sense data would never represent objects (Kant 1902-, *Ak* 11, p. 52). This remark clearly supports a conceptualist reading of Kant. Moreover, while discussing animals in the *Blomberg Logic* Kant states:

> Experience is nothing but reflected sensation, or sensation that is expressed through a judgment.
>
> Experiences, namely, are not mere concepts and representations but also judgments [;] e.g., the representation of warmth or of cold are concepts of experience. They are universal characters of things, but we cannot have insight into these merely through the senses, but actually only through judgment. Non-rational animals have no experience, then, but instead only sensations (Kant 1902-, *Ak* 24, p. 236).

Hence, animals do not have experience like humans do. Humans can have experience of the universal characters of things because they apply concepts to objects, i.e., they make judgments. This allows us, for example, to represent some particular ordered heap of bricks *as* a house, or a particular wooden structure *as* a tree. Animals, however, cannot represent the universal characteristic of things, and thus do not have experience in the strict sense of the term. Hence, the perceptual experience of animals is fundamentally different from that of humans. What distinguishes the mental life of animals from the mental life of humans is that animals do not cognize objects through concepts whereas humans do. In this sense, Kant's views on animal cognition support a conceptualist reading of Kant.

Conclusion

Kant's views on animals have been debated by conceptualist and non-conceptualist interpreters of Kant. According to non-conceptualist interpreters, Kant ascribed to animals the capacity for objective perceptual awareness, although he denied them concepts. According to conceptualist interpreters, Kant must conceptualize the mental life of animals as a blooming and buzzing confusion.

In this article I have provided a historical reconstruction of Kant's views on animals. I have situated Kant's views in the context of the writings of Buffon and Reimarus. I have shown that (i) both Buffon and Reimarus adopted a conceptualist position, according to which concepts structure the cognitive experience of adult humans, and (ii) that both described the mental life of animals as a blooming, buzzing confusion. Kant's position is virtually identical to that of Reimarus. Hence Kant's views on animals support a conceptualist reading of Kant.

In addition, the article has articulated the historical antecedents of Kant's view that concepts structure human experience. I have shown that both Buffon and Reimarus endorsed the view that concepts structure (human) cognitive experience. Hence, I show that eighteenth-century biological debates on animal cognition are important to understand the history of the idea that concepts structure human experience. Finally, I have provided a novel account of how the ideas of similarity and difference were conceptualized in eighteenth-century debates on animal cognition. I show that although the possession of concepts was taken to signal a clear difference between humans and animals in the eighteenth century, the fundamental distinction between animals and humans was taken to be based on a more fundamental difference: animals cannot, in contrast to humans, clearly and distinctly cognize similarities and differences. This fact explains why the mental life of animals is best described as a blooming and buzzing confusion.

Acknowledgments

This work was supported by The Netherlands Organisation for Scientific Research under project no. 277-20-007. I would like to thank Arianna Betti, Han Thomas Adriaenssen, Jeroen Smid, Boris Demarest and two referees for comments on early drafts.

References

Allen, C & Hauser, M.D. (1991). Concept Attribution in Nonhuman Animals: Theoretical and Methodological Problems in Ascribing Complex Mental Processes. *Philosophy of Science* 58 (2): 221-240.

Andrews, Kristin (2016). "Animal Cognition", *The Stanford Encyclopedia of Philosophy* (Summer 2016 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/sum2016/entries/cognition-animal/>.

Anonymous (1765). "Sensations." *The Encyclopedia of Diderot & d'Alembert Collaborative Translation Project.* Translated by Haydn Mason. Ann Arbor: Michigan Publishing, University of Michigan Library, 2015. http://hdl.handle.net/2027/spo.did2222.0003.118. Originally published as "Sensations," *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers,* 15:34–38 (Paris, 1765)

Buffon, G-L. [1753] (1785). *Natural History, General and Particular*. Volume 3. Translated by William Smellie. London: Strahan and Cadell.

Fisher, N. (2017). Kant On Animal Minds. *Ergo: An Open Access Journal of Philosophy* 4: 441-462.

Hanna, Robert, "Kant's Theory of Judgment", *The Stanford Encyclopedia of Philosophy* (Winter 2017 Edition), Edward N. Zalta (ed.), forthcoming URL = <https://plato.stanford.edu/archives/win2017/entries/kant-judgment/>.

Jaynes, J. & Woodward, W. (1974a). In the shadow of the enlightenment: II. Reimarus against the epicureans*". Journal of the History of the Behavioral Sciences* 10: 3-15.

Jaynes, J. & Woodward, W. (1974b). "In the shadow of the enlightenment: II. Reimarus and his theory of drives*". Journal of the History of the Behavioral Sciences* 10: 144-159.

Kant, I. (1902-). *Kants gesammelte Schriften*. Vol. I—XXIX (1902–1983). Berlin: De Gruyter, Reimer. Quotations from P. Guyer & A. W. Wood (Eds.), (1992–). *The Cambridge edition of the works of Immanuel Kant*. Cambridge: Cambridge University Press.

Katz, J.S. & Wright, A.A. (2006). *Same/Different* Abstract-Concept Learning by Pigeons. *Journal of Experimental Psychology: Animal Behavior Processes* 32 (1): 80-86.

Katz, J.S., Wright, A.A. & Bodily, K.D. (2007). Issues in the Comparative Cognition of Abstract-Concept Learning. *Comparative Cognition & Behavior Reviews* 2: 79-92.

Locke, J. (1690). *An Essay Concerning Humane Understanding*. London: Thomas Basset. Project Gutenberg EBook 2004.

Lötzsch, F. (1979). Vorbericht des Herausgebers. In F. Lötsch (Ed.), Hermann Samuel Reimarus Vernunftlehre (pp. Vii-XX). München: Hanser.

McLear, C. (2011). Kant on Animal Consciousness. *Philosophers' Imprint* 11: 1-16.

Mensch, J. (2013). *Kant's Organicism. Epigenesis and the Development of Critical Philosophy*. Chicago & London: The University of Chicago Press.

Nadler, S. (1992). *Malebranche and Ideas*. Oxford: Oxford University Press.

Reimarus, H. (1762). *Allgemeine Betrachtungen über die Triebe der Thiere, hauptsächlich über ihre Kunsttriebe*. Second edition. Hamburg: Bohn.

Reimarus, H. (1766). *Die Vernunftlehre, als eine Anweisung zum richtigen Gebrauche der Vernunft in dem Erkenntniss der Wahrheit, aus zwoen ganz natürlichen Regeln der Einstimmung und des Widerspruchs hergeleitet*. Third edition. Hamburg: Bohn.

Reimarus, H. (1772). *Die Vornehmsten Wahrheiten der natürlichen Religion*. Fourth edition. Hamburg: Bohn.

Roger, J. (1997). *Buffon: A Life in Natural History*. Transl. S.L. Bonnefoi. Ithaca: Cornell University Press.

Shettleworth, S.J. (2010). *Cognition. Evolution, and Behavior*. Oxford: Oxford University Press.

Siegel, Susanna (2016). "The Contents of Perception", *The Stanford Encyclopedia of Philosophy* (Spring 2016 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/spr2016/entries/perception-contents/>.

Simmons, A. (2002). *Changing the Cartesian Mind: Leibniz on Sensation, Representation and Consciousness*. *The Philosophical Review* 110: 31-75.

Sloan, P. (1979). "Buffon, German Biology, and the Historical Interpretation of Biological Species". *British Journal for the History of Science* 12: 109-153.

Tetens, Johann Nicolas. (1777). *Philosophische Versuche über die menschliche Natur und ihre Entwickelung* (Vol. 1). Leipzig: M.S. Weidmanns Erben und Reich.

Tulving, E. (1972). *Episodic and Semantic Memory*. In E. Tulving & W. Donaldson (eds.), *Organisation of Memory.* New York: Academic Press, 381-403.

Van den Berg, H. (2013). The Wolffian Roots of Kant's Teleology. *Studies in the History of Philosophy of Biological and Biomedical Sciences* 44: 724-734.

Van den berg, H. (2014). *Kant on Proper Science: Biology in the Critical Philosophy and the Opus postumum*. Dordrecht, Heidelberg, NY: Springer.

Wasserman, E.A. & Young, M.E. (2010). Same-Different Discrimination: The Keel and Backbone of Thought and Reasoning. *Journal of Experimental Psychology: Animal Behavior Processes* 36 (1): 3-22.

Wolff, C. [1732] (1968). *Psychologia Empirica*. Hildesheim: Olms.

Wolff, C. [1712] (1978). *Vernüftige Gedancken von den Kräften des menschlichen Verstandes und ihrem richtigen Gebrauche in Erkäntniß der Wahrheit*. Hildesheim: Olms.

Wolff, C. [1728] (1983). *Philososophia rationalis sive logica*. *Pars II*. Hildesheim: Olms.

Wolff, C. [1730] (2001). *Philosophia prima sive Ontologia*. Hildesheim: Olms.

Wolff, C. [1719] (2003a). *Vernünfftige Gedancken von Gott, der Welt und der Seele des Menschen, auch allen Dingen überhaupt*. Volume 1. Hildesheim: Olms.

Wolff, C. [1719] (2003b). *Vernünfftige Gedancken von Gott, der Welt und der Seele des Menschen, auch allen Dingen überhaupt*. Volume 2. Hildesheim: Olms.

Zammito, J.H. (2018). *The Gestation of German Biology: Philosophy and Physiology from Stahl to Schelling*. Chicago: The University of Chicago Press.

Zentall, T.R., Wasserman, E.A, Lazareva, O.F, Thompson, R.K.R, Ratterman, M.J. (2008). Concept Learning in Animals. *Comparative Cognition & Behavior Reviews* 3: 13-45.