

SPECIES BEYOND TAXONOMY

A Study of Species in Kierkegaard, Schelling, and Hegel

Thesis submitted for the degree of Doctor of Philosophy,
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Declaration of Authorship

I, Lydia Azadpour, hereby declare that this thesis and the work presented in it is entirely my own.
Where I have consulted the work of others, this is always clearly stated.

Chapters 3 and 4 contain substantial sections of material that have been published in my paper
'Kielmeyer's Economy of Extinction', in Azadpour and Whistler eds, *Kielmeyer and the Organic World:
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https://commons.wikimedia.org/wiki/File:De_La_Croix_1791_borametz.png

ABBREVIATIONS

- RF Karl Friedrich Kiemeier, 'On the Relations Between Organic Forces', in *Kiemeier and the Organic World* (Bloomsbury, 2020).
- GS Karl Friedrich Kiemeier, *Gesammelte Schriften*. Edited by Fritz-Heinz Holler. (Berlin: Keiper, 1938).
- CJ Immanuel Kant, *The Critique of Judgement*, trans. Werner S. Pluhar, (Indianapolis: Hackett, 1987).
- CPR Immanuel Kant, *The Critique of Pure Reason*, trans. Allen W. Wood, Paul Guyer, (Cambridge University Press, 1998).
- FO Friedrich Wilhelm Joseph Schelling, *First Outline of a System of the Philosophy of Nature*. Translated by Keith R Peterson. (Albany: State University Of New York Press, 2004).
- EE Friedrich Wilhelm Joseph Schelling, *Erster Entwurf Eines Systemes der Philosophie. Werke: Historisch-kritische Ausgabe*. Vol. 7. Ed. Hans Michael Baumgartner, Wilhelm G. Jacobs, and Hermann Krings. (Stuttgart: Frommann-Holzboog, 1976).
- VDW Friedrich Wilhelm Joseph Schelling, *Von Der Weltseele. Eine Hypothese Der Hohern Physik Zur Erklärung Des Allgemeinen Organismus*. Pp. Liv. 323. (Hamburg, 1806).
- JS1 Georg Wilhelm Friedrich Hegel, *Jenaer Systementwürfe*, ed. Heinz Kimmerle and Klaus Düsing (Hamburg: Felix Meiner Verlag, 1971).
- JS3 Georg Wilhelm Friedrich Hegel, *Jenaer Systementwürfe III, Naturphilosophie Und Philosophie Des Geistes*, ed. Rolf-Peter Horstmann (Hamburg: Felix Meiner Verlag, 1987).
- PS Georg Wilhelm Friedrich Hegel, *The Phenomenology of Spirit*, trans. A. V. Miller, (Oxford University Press: 1977).
- PN Hegel, G.W.F., *Philosophy of Nature*, 3 vols., edited and translated by M. J. Petry, (London: Allen and Unwin, 1970).

INTRODUCTION



Fig. 1. 'The Duck-Billed Platypus'.¹

"Of all the Mammalia yet known it seems the most extra-ordinary in its conformation; exhibiting the perfect resemblance of the beak of a Duck engrafted on the head of a quadruped. So accurate is the similitude, that, at first view, it naturally excites the idea of some deceptive preparation by artificial means; the very epidermis, proportions, serratures, manner of opening, and other particulars is the beak of a shoveler, or other broad-billed species of duck, presenting themselves to the view; nor is it without the most minute and rigid examination that we can persuade ourselves of its being the real beak or snout of a quadruped".²

¹ Shaw, G. *The Naturalist's Miscellany* 10 (1799), Plate 305. Image DOI: <https://doi.org/10.5962/bhl.title.79941>.

² Shaw, G. 'The duck-billed platypus' in *The Naturalist's Miscellany* 10 (London: Nodder & Co., 1799)

1: OUTLINE, METHODOLOGY, AND SCHOLARSHIP REVIEW

The period around the turn of the 19th century was a moment when ideas of species were undergoing intense discussion.⁶ In accordance with recent re-evaluations of Naturphilosophie in its historical context, the thesis examines conceptions of species in three thinkers working in the context of philosophy of nature around 1800: Carl Friedrich Kielmeyer, FWJ Schelling, and GWF Hegel.

Scholars have suggested this was a period where thinkers in the European tradition were moving beyond the theory and practice of taxonomy as the main way of thinking about species.⁷ Here I argue that Kielmeyer, Schelling, and Hegel illustrate that point in a vivid way; their interest in species focused on rather different issues. The first aim of this thesis is to show that there is a distinctive and historically important conception of species which all three figures under consideration express in different ways, which despite its distinctiveness has not yet been addressed in the various relevant fields of scholarship.⁸ But because they are different thinkers, with different metaphysical and methodological commitments, the thesis also aims to exhibit the different expressions of that more general thesis concept in the different ways it emerges in their writings. It aims to show the ways the three figures under consideration drew on and responded to the views of species held by the others, and to explain why their respective views of the concept of species developed as they did.

The general conception of species I think is at play in these thinkers can be explained schematically as follows, by contrast with two alternatives. For some thinkers, the species is in a certain sense prior to the individual organisms that are members of that species. In such cases, the species an individual belongs to dictates what an individual is, its characteristics, how it develops and behaves, and so on. While not necessarily temporally prior, or able to exist independently of the individual organisms that it are members of it, the species is something which genuinely exists and prescribes the nature of the individuals.⁹ For other thinkers, the species an individual belongs to is posterior to the individuals,

⁶ A number of different historical frames have been proposed for the period. According to some accounts, this period sets the stage set for the arrival of Darwinism, either as precursor or as obstacle. For Foucault, it is the period where descriptive taxonomies gave way to a new epistemology focused on functional anatomy. Recently, following Mary P. Winsor, scholars have questioned the previously dominant narrative of Ernst Mayr that held essentialism about species was prevalent in this period of pre-Darwinian thought, giving way to transformism in Darwin's wake. See Michel Foucault, *The Order of Things*, (London: Routledge, 2001), and Mary P. Winsor, 'Non-Essentialist Methods in Pre-Darwinian Taxonomy'. *Biology & Philosophy* 18: 387–400 (2003), and Ernst Mayr, *The Growth of Biological Thought*. (Cambridge: Harvard University Press, 1982).

⁷ Michel Foucault is the most prominent philosophical exponent of this historical view. Although his work has been of great interest, I would not accept much of Foucault's story and do not rely on his historical and philosophical framework. I explain further how my project and views differ from his in footnote 92 and discuss taxonomy in more detail in Chapter 2.

⁸ See below for a statement of which fields of scholarship, and the survey of scholarship in Chapter 1 for evidence of this claim.

⁹ In other words, this broad species conception takes in both Platonic views, where the species exists independently and even without necessarily being instantiated in an individual, or in an Aristotelian where the species must be instantiated in individuals but nevertheless has some being of its own (these claims are not meant as interpretations of Plato or Aristotle).

which are the primary, or only things which genuinely exist.¹⁰ Paradigmatically, species in such cases would be abstracted from either real features of various individuals or elements of our interaction with those individuals. The species in this case may be a concept or a word which picks out particular individuals, but either way it neither exists before nor has any kind of ontological priority over the individuals that are said to be members of the species.

By contrast, the thinkers under consideration here extend the ‘organic’ structure of *mutual determination* to the relation between individual and species, so that differences between individuals – and hence individuals themselves – make a real and positive contribution to what it is to be a member of that species. Species are in one sense prior to the individuals, and in another sense posterior. As with the first alternative view just mentioned, the species of an individual plays a concrete role in the development and activities of the individual. Equally, by contrast with the first alternative view, species do not just require instantiation in individuals, but are incomplete and lacking a certain content without the individuals that make it up. As with the second alternative view, the individuals which are said to be members of a species make up the species. But by contrast with this second alternative view, it is not only a species concept that picks out particular individuals that comes about in this way – the species itself is partially constituted by the individuals which make it up, and partially constitutes those individuals.

That means in turn that the figures under consideration here view individuals as the *result* of *processes* of formation. They use their consideration of species to expand the theorisation of the ‘organic’ beyond the broadly Kantian concern with teleological judgement to involve other organic processes.

Something’s being organic involves forces that are supra-individual, and takes place across generations, in interactions between organisms, and within and outside species boundaries. The precise emphasis on these different aspects is where many of the differences between the three thinkers in question come into play.

As such, the scope of the project covers the history of science and the history of philosophy.¹¹ In particular, it is a project in the history of the philosophy of science – its focus is on how certain thinkers

¹⁰ In other words, this broad species conception takes in both Platonic views, where the species exists independently and even without necessarily being instantiated in an individual, or in an Aristotelian way, where the species must be instantiated in individuals but nevertheless has some being of its own (these claims are not meant as interpretations of Plato or Aristotle).

¹¹ It is anachronistic to draw too stark a distinction between the life sciences and philosophy in the period covered by the thesis. This is well-established in the literature, as I showed in my literature review discussions of *Naturphilosophie* and the work of Timothy Lenoir (Chapter 1). It would be more accurate to speak of a continuum of approaches: different thinkers of the

reflected philosophically on the various considerations about species available to them. Nevertheless, it does not aim to intervene in contemporary debates in the philosophy of biology, ecology, or metaphysics and ontology. The object is to provide as accurate a historical account of the views and arguments of the thinkers in question as possible. This task remains one for the history of philosophy, because philosophical tools are needed to understand the philosophical tools used explicitly or implicitly by the thinkers addressed by the project, as well as the differences between the views they hold.

The thesis considers these three thinkers in particular for a number of reasons.¹² There is a general shared conception of species that is shared by all three, despite their different metaphysical outlooks and attitudes to the empirical material with which they are dealing. They also engage explicitly and implicitly with one another. There is also a developmental story that can be told in the way they each both draw on and reject aspects of each the earlier thinkers under consideration. Nevertheless, this developmental story should not be taken to be a strict progression towards a more adequate view of species. Instead, the three authors I discuss should be taken as expressions of different ways that the conception of species is expressed. Accordingly, the texts I work with are chosen in large part (but not exclusively – see the relevant section: ‘Selection of Material’) those where the most distinctive expression of their conceptions of species, rather than because they were the most well-known texts or where a philosopher sounds closest to one of the others under consideration.

The value of the project consists in providing a new general picture of the development of the species concept across the three main figures considered in the project. It both outlines a distinctive general account of species to which all three subscribe in different ways, and shows how and why they differ

time were more or less attentive the necessity of working out the metaphysical or ontological commitments of their theories about species, organisms, life and so on. Because the disciplinary boundaries were in the process of being formed there was no sense that some questions were definitely beyond the bounds of philosophical enquiry, or that what we (or they) would think of as philosophy should necessarily be left to one side in inquiries into the nature of species, for example. There could be disagreement as to whether particular methods, observations or philosophical readings of the material were appropriate though – but that was part of the debate. A historian of philosophy looking at the period would misrepresent the philosophical landscape by ignoring the work in what we would now call biology. Similarly, nowadays there is overlap between contemporary empirically-informed philosophy of biology and theoretical biology. See the section of the thesis on ‘methodology’ for more detail.

¹² My view is that these three thinkers best express the view of species that is the subject of this thesis. But selecting these three thinkers does mean setting aside or treating as important background certain other figures. There are many who formed part of the ongoing debates Kierkegaard, Schelling, and Hegel were involved in. There are two in particular who do not feature as focal points of the project, although very important for the thinkers who are under consideration, Kant and Goethe. Kant provides essential background, and is frequently referred to in the thesis, but he does not share the general view of species I will ascribe to Kierkegaard, Schelling, and Hegel. With respect to Goethe, there are indeed certain similarities between the general species conception. However, in my view, the thinkers I focus on go further than Goethe regarding the extent to which the individuals informed by species mutually determine or shape the species in some way. Equally, the thesis is most concerned with species concepts as *infimae species*, rather than the even more general kingdom-level concepts. Accordingly, Goethe again provides important background material, but cannot be considered at length here. Even philosophers, or philosophically-minded natural scientists close to the thinkers I have selected cannot all be the focus of extended discussions.

from one another. A secondary source of the value of the project consists in the interventions it makes in particular debates in the scholarship on the figures. Some of these interventions rely on the broader picture involving all three of Kiemeier, Schelling, and Hegel, but others do not.

My hope is that historians of philosophy and science reading the thesis will engage with a new account of the historical development of the conceptions of species held by these thinkers, historians of the philosophy of science will engage with a distinctive approach to the natural scientists that results in these conceptions of species, and scholars of the individual thinkers under consideration working in both the history of philosophy and history of science will benefit from the particular interventions in the scholarly debates.

Investigation of species is also used to illuminate aspects of each thinker under consideration and to intervene in more localised debates:

1. Kiemeier formulates a conception of species that, whilst in some ways remaining in the tradition of thinking about natural economies, is constructed to be able to explain and project historical changes in species dynamics. The thesis argues that by emphasising relations of force, Kiemeier develops a proto-ecological view of species as constituted via and subject to interrelations with other kinds and their environment. This means that species can change – and even die out. I also critically examine the suggestion that Kiemeier explains species only by proportions of force, and finally claim that Schelling's famous appropriation of Kiemeier's work emphasises the hierarchical elements of Kiemeier's thought at the expense of the levelling aspect involved in the equilibrium in the natural world he advocates.
2. With respect to Schelling's early writing about nature, the thesis argues that Schelling's early account of the species-individual relation is a reflection of and potentially the model for a larger metaphysical question of priority. This question of priority can be seen as a mutual determination of part and whole that is embedded in Schelling's project of *Naturphilosophie*, which tries to understand nature from the perspective of both productivity and product. A species is at the same time a particular stage of the unfolding of nature, involved in the constitution of the individuals which make it up, and constituted by those individuals.
3. The issue of species also throws into relief differences between Schelling and Hegel, such that Hegel's philosophy of nature is not simply derivative of Schelling's but takes a different stance on the species-individual relation, with Hegel's ontology ultimately placing greater emphasis on individuals (in certain ways) than Schelling. In the end I will claim Hegel's lectures on the philosophy of nature from his Jena period explicitly give species high import as the way 'the idea'

exists. Species forms a condition for the activities and characteristics of individuals; at the same time, however, I suggest that there is an important role for individuals in the constitution of their species to be found in the Jena period materials. Taking into account Hegel's claims about the way individuals and species distinguish themselves is the crucial point here. Nevertheless, there is a sense in which Hegel's adherence to an ideal for species means his view is less able to take into account variation and difference than Schelling's.

Outline of The Thesis

This introductory chapter will review the main developments in relevant scholarship (scholarship in the history of science, scholarship on Kierkegaard, Schelling, and Hegel). I suggest that Kierkegaard, Schelling, and Hegel are left out of considerations on the history of the idea of species that focus on scientific developments, and that the issue of species has until recently rarely been addressed in philosophy scholarship on Kierkegaard, Schelling and Hegel. I argue that both these areas of scholarship could be enriched by examining this topic. I then justify my selection of material for study, which spans the years from 1793-1806. Finally, I address some terminological and translation ambiguities surrounding species, or 'Gattungen', and its use in the Schelling, Kierkegaard, and Hegel. In chapter 2, I continue my introduction by providing background contextual information for the issues that will be raised in the thesis. In Chapter 3, I introduce Kierkegaard's picture of nature. I suggest that on many topics, he remains open and ambiguous. Nevertheless, his bold conjectures, whilst hesitantly couched, open up a view of organisms that prioritises forces, rather than individuals, as the basis of an ontology. Because of this priority of forces, and his model of the organic world as composed by an equilibrium of force, I go on to say in Chapter 4 that Kierkegaard is able to countenance, and provide an explanation of, species extinctions. In Chapter 5, I describe the goals of Schelling's philosophy of nature, in order to draw out the import of understanding the activities that underlie nature's apparent products. I suggest that species members are unified by their role as expressions of the activity of nature that are all inhibited at the same stage. In the following chapter I suggest that the tension between productivity and product at the heart of Schelling's philosophy of nature is reflected in the way that Schelling articulates the identity relation between individual and species in the *First Outline* – in which individuals express parts of a whole. The productivity-product relation involved in considering nature as a whole can be seen when contemplating the relation between species and individual. In Chapter 7, I outline the various roles played by species in Hegel's Jena period, and it also address Hegel's view that the organic involves both individual-species processes and species-individual processes. Following this, Chapter 8 details the critiques of taxonomies that form part of Hegel's more general concerns about projects of categorisation that force the objects of study into rigid formal systematisations. The aim of drawing out critiques of taxonomic principles from the *Phenomenology* is to complement the claims that 1) philosophy of nature proper is not focused on taxonomy, and 2) hence what is of interest to Hegel in his discussions of *Gattung* is goes beyond taxonomic and classificatory issues. Following this I suggest that Hegel's Jena writing on species does not easily fit into any of the positions described in the debates on essentialism in Hegel literature.

Scholarship Review

Whilst Kielmeyer, Schelling, and Hegel's respective engagements with issues surrounding species shows them engaging with the debates of the day, they also all, in their own ways, move beyond taxonomic concerns. To date, however, the role of organic natural kinds – in particular, the issue of species – in the work of these philosophers has received little attention in the relevant fields of scholarship: research into the history of the life sciences on the species problem, and the philosophical scholarship addressing the thinkers in question. In this section, I will give a brief overview of the relevant scholarly debates in these areas and indicate the contributions my project makes to such debates.

Of the recent literature on the history of the species concept, the works of the thinkers I address (from about 1790-1806) is overlooked in favour of more influential French- and English-language works. For example, in the history of science and philosophy, R.A. Richards immediately shifts focus from Linnaeus and Buffon to Darwin in his historical account of species concepts.¹³ Wilkins and Ereshefsky are more extensive, but neither mentions the contributions of Schelling, Kielmeyer, or Hegel.¹⁴ When Kielmeyer has been mentioned in works on the history of science, it has usually been in relation to the theory of recapitulation or biogenetic law, where he is put forward as a predecessor of this theory.¹⁵

Due to the long shadow retrospectively cast by the work of Darwin, research on the issue of species in the history of science tend to focus on evolution at the expense of, first, the principles and significance of classificatory systems, which were equally a concern of that history (in line with e.g. Glass, R.J. Richards, and Winsor) and second, the roles played by species concepts in philosophical understandings of nature from the time.¹⁶ This oversight may also be due to the attempt to retrospectively demarcate 'legitimate' scientific undertakings from wild speculation, as for example in Timothy Lenoir, who identifies Schelling and Hegel with the latter, and Kielmeyer with the former.¹⁷ Such a viewpoint, however, appears to be outdated, since scholars increasingly recognise the importance and value of Schelling and Hegel's respective philosophies of nature, along with the import of romantic

¹³ See R. A. Richards, *The Species Problem* (NY: Cambridge University Press, 2010).

¹⁴ John Wilkins, *Species: a History of the Idea*. (Berkeley, CA: University of California Press, 2009); and M. Ereshefsky, *The Poverty of the Linnaean Hierarchy: A Philosophical Study of Biological Taxonomy*. (Cambridge: Cambridge University Press, 2001).

¹⁵ For example, in Stephen J Gould, *Ontogeny and Phylogeny*, 45 (Winter 1978): 652-653. But as Sander Gliboff has pointed out, Kielmeyer does not anticipate a recapitulation in form, but just that the same forces are at work in both sets of development. This is also noted by Iain Hamilton Grant in *Philosophies of Nature after Schelling*. (Continuum, 2004).

¹⁶ See Bentley Glass, *Forerunners of Darwin, 1745-1859*. (Baltimore: John Hopkins Press, 1968); R. J. Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behaviour*. (1989); and Winsor, 'Non-Essentialist Methods in Pre-Darwinian Taxonomy' (2006).

¹⁷ Timothy Lenoir, *The Strategy of Life: Teleology and Mechanics in Nineteenth-Century German Biology*. (Chicago: University of Chicago Press, 1989).

science more broadly, and their influence on the recognised scientific developments in the work of such diverse thinkers as, for example, Treviranus, Goethe, Haeckel, and Ørsted.¹⁸ Recent work has shown that Schelling and other thinkers of the period dubbed ‘*Naturphilosophen*’ can be seen to be more than a “black plague” on science, but rather as influential in the emergence of biology as a distinct science with its own objects and methods.¹⁹ Recent English language works signal a new wave of acknowledgement of his importance in the life sciences of the time and as engaging with Schelling: scholars such as Zammito, Steigerwald, and Gambarotto have paved the way for a more in-depth consideration of the relation between Kierkegaard, Schelling, and Hegel – whilst these recent works acknowledge the importance of these thinkers in the conceptual formation of the life sciences, all three of these focus on the concept of life; Zammito and Gambarotto are particularly concerned with discipline formation.²⁰ Whilst these are highly valuable works, my project will focus instead on looking at how these three thinkers employed the concept of *species*: what was distinctive about their approaches and the philosophical role it held for these thinkers. The considerable role of species in Schelling and Hegel’s works, however, and ambivalence between its use as a logical and as a biological concept, has not yet been fully addressed. In addition, a clear-cut historiographical distinction between Kierkegaard, on the one hand, and Schelling and Hegel, on the other, obscures the complexity of the positions at work in these thinkers and their interrelation, which scholars have now made clear.²¹

Among scholars who address Schelling, Kierkegaard, or Hegel’s philosophies of nature, the issue of species is often overlooked.²² Regarding Schelling, Matthews briefly discusses species, but only in the context of the early *Timaeus* commentary and not his following works that focus on developing his own philosophy of nature.²³ When species, genus and classification are discussed in the literature on Hegel,

¹⁸ Regarding the influence of *Naturphilosophie*, see e.g. Matthias Jakob Schleiden. Schelling’s und Hegel’s Verhältnis zur Naturwissenschaft. Hg. Olaf Breidbach. (Weinheim: Acta Humaniora VCH Verlagsgesellschaft, 1988); Olaf Breidbach, Schellings und Hegels Verhältnis zur Naturwissenschaft. (Weinheim: VCH 1988). Regarding romantic science, see e.g., Jocelyn Holland, “Balancing Acts: Equilibrium in Romanticism and Nature Philosophy around 1800” in *New Work on German Romanticism*, (Romantic Circles Praxis Series, 2016); Joan Steigerwald, *Organic Vitality in Germany Around 1800* (University of Pittsburgh Press, 2019); Dalia Nassar, *The Romantic Absolute: Being and Knowing in German Romantic Philosophy* (University of Chicago Press, 2014).

¹⁹ John Zammito, *The Gestation of German Biology: Philosophy and Physiology from Stahl to Schelling*. (Chicago: The University of Chicago Press, 2018).

²⁰ See e.g., Zammito, *The Gestation of German Biology*; Joan Steigerwald, *Experimenting at the Boundaries of Life, Organic Vitality in Germany Around 1800* (University of Pittsburgh Press, 2019); and Andrea Gambarotto, *Vital Forces, Teleology and Organization: Philosophy of Nature and the Rise of Biology in Germany*, (Cham: Springer 2018),

²¹ See e.g., Cinzia Ferrini, ‘From Disparagement to Appreciation: Shifting Paradigms and Interdisciplinary Openings in Interpreting Hegel’s Philosophy of Nature’. *Esercizi Filosofici* 9: 1-13. (2014); Robert Richards, *The Romantic Conception of Life - Science and Philosophy in the Age of Goethe* (University of Chicago Press, 2002); Frederick Beiser, *German Idealism: The Struggle against Subjectivism 1781–1801*. (Cambridge, MA: Harvard University Press, 2002).

²² See e.g. Bernd-Olaf Küppers, ‘Natur als Organismus: Schellings frühe Naturphilosophie und ihre Bedeutung für die moderne Biologie’, *Philosophische Abhandlungen* 58, (Frankfurt a/M: V Klostermann, 1992), p. 138; Sebastian Schwenzfeier, *Natur und Subjekt. Die Grundlegung der schellingschen Naturphilosophie*. (Freiburg 2012).

²³ Bruce Matthews, *Schelling’s Organic Form of Philosophy*. (NY: SUNY Press, 2011).

these are often brief mentions rather than detailed systematic examinations.²⁴ To date only Schmitt, Zammito, and Richards address species in several *Naturphilosophen* including Schelling. However, they do not include Hegel or clarify the relation of the issues to the respective systems of each thinker, and species is not the focal point of their investigations.²⁵ Scholars working on Hegel or Schelling sometimes discuss lower-level natural kinds, (e.g. Kreines, Stern),²⁶ but have rarely treated the role of organic species.²⁷ Other authors do not focus on the concept of species itself but attempt to determine whether the work of Schelling or Hegel anticipates or is compatible with Darwinian evolutionary thought. In Schelling's case, this includes R.J. Richards, and in Hegel's, Houlgate and Kolb.²⁸ These contributions testify to the continuing interest in Schelling and Hegel's philosophies of nature, but the centrality of their focus on evolution does not address my project's broader aims, which try to look at the way these thinkers treated the concept and how they employed it in their works.

Kiellmeyer Scholarship

In his lifetime, although he published little, Kiellmeyer was well known in the German-language intellectual scene. Scholars have acknowledged that Kiellmeyer's work was of interest to figures such as Schelling, Eschenmayer, Goethe, Alexander von Humboldt, Hegel, and in the development of comparative anatomy.²⁹ Kiellmeyer's influence in philosophy and life science in the early 19th century has been developed in examinations of the relation between Schelling and Kiellmeyer (in Bach, Richards, Zammito) and Kiellmeyer and Goethe (in the work of Bersier).³⁰

²⁴ E.g., Klaus Brinkman, Hegel on the animal organism'. *Laval Théologique et Philosophique*. Vol. 52, n° 1, (1996): 135-153; and James Kreines, 'Metaphysics Without Pre-Critical Monism: Hegel on Lower-Level Natural Kinds And The Structure Of Reality'. *Hegel Society of Great Britain* Vol. 57/58, (2008): pp. 48-70.

²⁵ Schmitt brings together the work of several philosophers of nature to discuss classification, see Stephane Schmitt, 'Succession of Functions and Classifications in Post-Kantian Naturphilosophie around 1800', in Huneman ed., *Understanding Purpose: Kant and the Philosophy of Biology* (Rochester, NY: University of Rochester Press, 2007) 123-137; Richards, *The Romantic Conception of Life*.

²⁶ Kreines, 'Metaphysics without Pre-Critical Monism; Robert Stern, *Kant, Hegel and the Structure of the Object*. (London: Routledge, 1990).

²⁷ Notable exceptions are addressed below.

²⁸ For Schelling, e.g., Richards, *The Romantic Conception of Life*; and Hegel, Stephen Houlgate, 'Hegel and Evolution' in *An introduction to Hegel, Freedom Truth and History*. (Blackwell, 2005) p. 173-4; and David Kolb, 'Darwin Rocks Hegel: Does Nature Have a History?', *Hegel Bulletin* 29 (2008):97-117.

²⁹ See Kai Torsten Kanz, 'Kiellmeyer's Fame and Fate', for an overview of Kiellmeyer's reception.

³⁰ For the relation between Goethe and Kiellmeyer, see Gabrielle Bersier, 'Visualizing Carl Friedrich Kiellmeyer's Organic Forces: Goethe's Morphology on the Threshold of Evolution'. *Monatshefte* 97, No. 1 (2005): 18-32. The Schelling/Kiellmeyer relation has been discussed in Thomas Bach, *Biologie Und Philosophie Bei C.F. Kiellmeyer Und F.W.J. Schelling* (Stuttgart-Bad Cannstatt: Frommann-Holzboog, 2001); in Richards, *The Romantic Conception of Life*, and in Zammito, *The Gestation of German Biology*.

Much of the discussion of Kiemeyer has focused on his use (or not) of teleological reasoning, his potential introduction of the phylogenetic law,³¹ his “temporalisation” of “the great chain of being”,³² his role in the formation of biology as its own discipline,³³ or whether he was an evolutionist. Because of these different focuses, most authors who address Kiemeyer summarise his results but do not go into the details of his account of proportions of force, despite the fact that this formulation bears on these issues. Kiemeyer’s formulation of this – and the concepts he employs to do so – thus deserves a more detailed examination.

However, in anglophone scholarship, especially on the history of the life sciences, Kiemeyer was rarely mentioned, even in passing, until the 1980s.³⁴ Since then, the importance of Kiemeyer to the intellectual landscape of early 19th century science and philosophy has been increasingly recognised in anglophone scholarship. This largely follows Timothy Lenoir, whose various influential studies³⁵ argued that a unified research programme³⁶ could be discerned from Kant and Blumenbach³⁷ through Kiemeyer, Reil, Treviranus, and others. Lenoir claims that this particular research programme – teleomechanism – is a distinct mode of investigation in which neither reductive mechanism nor vitalism are endorsed. Scholars such as Richards, Lettow, and Zammito have pointed out that this division into distinct research programs can have a distorting historiographical effect insofar as it draws boundary lines between scientific works and those of *Naturphilosophie* (this discussed further below). Since Lenoir, Kiemeyer scholarship has tended to focus either on defending the interpretation of Kiemeyer as employing a regulative understanding of teleology to understand organisms (Coleman, Reill) or, as has been the trend more recently, scholars reject this reading and suggested that Kiemeyer gives teleology a

³¹ E.g. William Coleman, ‘Limits of the Recapitulation Theory: Carl Friedrich Kiemeyer’s Critique of the Presumed Parallelism of Earth History, Ontogeny, and the Present Order of Organisms,’ *Isis* 64, no. 3 (September 1973): 341–50; and Richards, *The Romantic Conception of Life*.

³² This claim is made by Zammito in John H Zammito, *The Gestation of German Biology Philosophy and Physiology from Stahl to Schelling* (Chicago And London The University Of Chicago Press, 2018), and Bersier in Bersier, Gabrielle. “Visualizing Carl Friedrich Kiemeyer’s Organic Forces: Goethe’s Morphology on the Threshold of Evolution.” *Monatshefte* 97, no. 1 (2005): 18–32: “In so doing [i.e. in creating a systematic account of the interaction of forces] he “animated Charles bonnet and Carl Linnaeus static ladder of creatures”; “by transforming the hierarchy of immutable creatures into a dynamic gradation of changing, developing, and self-regulating lifeforms, he lent concrete scientific shape to herder’s vague notion of a gradation of organisations [...]”. p.258.

³³ E.g. Gambarotto *Vital Forces, Teleology and Organization*; Zammito, *The Gestation of German Biology*.

³⁴ E.g. Ernst Mayr, *The Growth of Biological Thought* (Harvard University Press: 1982); Wilkins, *Species: A History of the Idea*.

³⁵ e.g. in Timothy Lenoir, “Kant, Blumenbach, and Vital Materialism in German Biology,” *Isis* 71, no. 1 (March 1980): 77–108, and in his book, *The Strategy of Life*.

³⁶ This division between those that belong to a Kantian research program from those that do not is often used to stress the legitimacy of Kiemeyer’s place in the history of the life sciences over against the “bold metaphysical speculation” of *Naturphilosophen* like Schelling. This demarcating historiographical agenda has been criticised by Nassar, Schmitt, and others.

³⁷ Lenoir’s alignment of Kant with Blumenbach has also been criticised. For example, Richards writes that Blumenbach, “used the *Bildungstrieb* as part of a constitutively causal account of organization. After 1790, he continued to employ the *Bildungstrieb* in the formation of general laws, comparable to the way Newton used the concept of gravity”: see Robert J. Richards, ‘Kant and Blumenbach on the *Bildungstrieb*’, *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 31 (2000): 11–32.

‘constitutive’ role in the operation of organic nature.³⁸ This position is promoted by e.g. Bach, Gambarotto, Hunemann, Richards, Schmitt, and Zammito.³⁹ As I will address in chapter 3, this discussion is complicated by different interlocutors discussing the opposition in terms of ‘heuristic’ or ‘regulative’ and constitutive uses of teleology, though the meaning of the former two terms is not at first glance quite the same. Moreover, I want to suggest Kiemeier’s deliberate ambiguity on this, as well as many issues, is part of his uniqueness and perhaps a reason why his work was able to be influential to thinkers with various outlooks.

Whilst these are important and valuable debates, moving beyond the framework prescribed by Lenoir, looking at Kiemeier’s own stated aims and asking questions about how he thinks about species will illuminate other characteristics of his work.⁴⁰

Schelling Scholarship

Where previously Schelling (as well as Fichte) had been overshadowed by Hegel in anglophone scholarship, in recent years a wealth of literature has sprung up that emphasises Schelling’s philosophical contributions.⁴¹ Of these works, the most valuable to my project are those focusing on Schelling’s early period that deal with aspects of Schelling’s philosophy of nature: the last fifteen years has seen the publication of many helpful collections and monographs on Schelling’s *Naturphilosophie* as well as his intellectual milieu.⁴²

³⁸ Examples include William Coleman and P.H. Reill: see William Coleman, ‘Limits of the Recapitulation Theory: Carl Friedrich Kiemeier’s Critique of the Presumed Parallelism of Earth History, Ontogeny, and the Present Order of Organisms,’ *Isis* 64, no. 3 (September 1973): 341–50; and Peter Hanns Reill, *Vitalizing Nature in the Enlightenment* (Berkeley, Calif.: University of California Press, 2005).

³⁹ Critique of Lenoir’s views on Kantianism in the sciences in this period has become so much of a focus of the debate that Lenny Moss referred to it as a “cottage industry” in his review of Zammito’s latest work. See Lenny Moss, ‘Review: The Gestation of German Biology: Philosophy and Physiology from Stahl to Schelling,’ *Notre Dame Philosophical Reviews* (2018) <https://ndpr.nd.edu/news/the-gestation-of-german-biology-philosophy-and-physiology-from-stahl-to-schelling/>.

⁴⁰ To this end, I have also contributed to a volume (edited with Daniel Whistler), bringing together the work of different scholars who discuss a wide variety of aspects of Kiemeier’s work and expand the topics of consideration of Kiemeier in scholarly literature. The volume also includes translations in hope of making Kiemeier’s work more widely accessible. See Azadpour and Whistler eds, *Kiemeier and the Organic World: Texts and Interpretations*. (Bloomsbury Academic: 2020).

⁴¹ E.g. Beiser, *The Struggle Against Subjectivism*; Nassar 2014, Dale E. Snow 199 *Schelling and the End of Idealism*, Matthews, *Schelling’s Organic Form of Philosophy*.

⁴² Monographs such as Charlotte Alderwick, *Schelling’s Ontology of Powers*, (Edinburgh University Press, 2021); *Schelling’s Naturalism*, Ben Woodard, (Edinburgh University Press, 2015), *Philosophies of Nature after Schelling* (Continuum, 2006) by Iain Hamilton Grant; and collections *Interpreting Schelling: Critical Essays*, ed. Lara Ostaric (2014), and *Nature, Speculation and the Return to Schelling*, eds. Tritten and Whistler (2018). In addition, the translation of more of Schelling’s works into English, such as Keith R. Peterson’s invaluable translation of *FO*, have accompanied and furthered this rejuvenation of anglophone interest in Schelling.

One of the main areas of disagreement about Schelling's corpus surrounds the division of his work into distinct periods of thought. In this schema, he is traditionally thought to have moved away from an initial Fichtean period (1794-1796) to produce his early work on the philosophy of nature (1797-1800), which was followed by the identity philosophy (1801-1805), then the middle period (1809-1815), and finally the late period which frames his investigation in terms of negative and positive philosophy (1820-1850).⁴³ Recently this periodisation has come under increasing criticism from scholars.⁴⁴ I explain my decision to focus only on work from the second of these periods – Schelling's early work in philosophy of nature – later in this chapter.

When it comes to the issue of species in Schelling, some works in the abovementioned wave of research on Schelling's philosophy of nature have begun to touch on this issue. Scholarly works that focus on this issue often focus on the topic of evolution, for example, RJ Richards. Other works that have addressed species in Schelling include Schmitt and Krell. Although these texts are valuable and relevant to my topic, their focus is different.⁴⁵ In addition, there are many valuable discussions to be found within larger works, two influential examples (mentioned above) such as in Beiser and Zammito. I will distinguish my approach by situating Schelling's treatment of species alongside Kierkegaard and Hegel, and by addressing the relation between his account of species and his project of philosophy of nature. I will try to show how his treatment of species is affected by his understandings of identity and organic processes.

Further, the relation between Schelling and Hegel's philosophies is much debated. Many authors that discuss their relation do not consider their philosophies of nature (e.g. Laughland); others address nature but not the life sciences, focusing on physics (e.g. Schleiden).⁴⁶ Whilst Schelling is usually understood to have been the key founder of Naturphilosophie as a project, scholars often emphasise one thinker at the expense of the other, e.g. Beiser finds Hegel merely derivative of Schelling, by contrast for Magee Hegel's contribution is more informed and developed than Schelling's.⁴⁷ For Stone, Hegel's understanding of nature lacks the 'creative' facet of Schelling's work.⁴⁸ Addressing their respective accounts of species will shed light on the nuances of their relation – one example I will

⁴³ See the summary given by Berger and Whistler, in Berger and Whistler, eds., *The Schelling Reader*, p.6.

⁴⁴ In more recent years, scholars have problematised a clear periodisation of Schelling's work, as in Iain Hamilton Grant's *Philosophies of Nature After Schelling*, (Continuum, 2006). Matthews suggests another alternative view of the organic form of freedom as a unifying theme of Schelling's career: see Matthews, *Schelling's Organic Form of Philosophy*.

⁴⁵ Krell does not focus on the concept of species, but instead on related concepts of sexuality, illness and death in Novalis, Schelling, and Hegel, see David Krell, *Contagion*, (Indiana University Press, 1998). Schmitt, Stéphane. 'Succession of Functions and Classifications in Post-Kantian *Naturphilosophie* around 1800'. In Huneman ed., *Understanding Purpose: Kant and the Philosophy of Biology* (Rochester, NY: University of Rochester Press, 2007) 123-137.

⁴⁶ Laughland, John. *Schelling versus Hegel*. (Routledge, 2007); Matthias Jakob Schleiden. *Schelling's und Hegel's Verhältnis zur Naturwissenschaft*. Hg. Olaf Breidbach. (Weinheim: Acta Humaniora VCH Verlagsgesellschaft, 1988).

⁴⁷ Glen Alexander Magee, *Hegel and the Hermetic Tradition* (Cornell University Press, 2001); Beiser, *German Idealism*.

⁴⁸ Alison Stone, *Petrified Intelligence*.

address in the thesis is the different status given to differences in a species, which seems to be given greater value in Schelling's work. In addition, the neglected role of Kierkegaard as interlocutor with both Hegel and Schelling will be drawn out by this study.

Hegel Scholarship

As I mentioned in above, there has not been a huge amount of literature that deals with Hegel's account of 'Gattungen', genus or species. Scholarship, especially in the English language, has often overlooked the concept of species in Hegel, despite its clear import, which I aim to demonstrate in the following chapters. For the most part, this topic has come up in scholarly analyses of Hegel's later *Science of Logic* (1818, 1830), and is of necessity dealt with briefly as part of a sequential run through of the dialectic.⁴⁹ In studies of Hegel's *Encyclopedia*, too, focus has often been on his later works and usually will either mention species in an overview of Hegel's organics without analysing this concept in detail, or addresses species only via the issue of whether or not Hegel can be considered an evolutionist.⁵⁰ These discussions consequently tend to focus on whether or not Hegel can be updated, rather than attempting to understand what is distinctive about historical approaches.

In recent years, however, scholars such as Henry Somers-Hall, Karen Ng and James Kreines have given more sustained attention to the notion of species itself in Hegel.⁵¹ Ng has even claimed that "gattung-concepts" are "central to Hegel's argument": "in Hegel's account of judgement, the genus is an "objective universality" that provides the necessary context for predication, and... governs the ascription of normative predicates to the subject..."⁵² This suggests that the importance of species to Hegel's thought is being increasingly recognised. As I will discuss in chapter 7, in the last five years work has sprung up that addresses the concept of species in Hegel's later *Science of Logic* and *Encyclopedia of the*

⁴⁹ For example, a couple of pages in Stanley Rosen's *The Idea of Hegel's Science of Logic* (468-479), where he takes the genus section to suggest that sex 'takes the individual living thing outside itself and raises it to the level of activity of the genus', and conversely, that 'the genus is reflected into itself [...] and obtains actuality' and the child 'expresses the shift from life to knowing' (469). Two and a half pages (559-571) are devoted to 'genus' in David Gray Carlson's *Commentary to Hegel's Science of Logic*, where he understands the genus section to be about life 'as the genus as such' when thinking about the absolute. Given the broad aims of these works, this is not meant as critique, but to point out the conceptual space for a deeper consideration of the topic of species.

⁵⁰ For discussion of Hegel and his rejection of species transformism, see Stephen Houlgate's 'Hegel and Evolution' in *An introduction to Hegel, Freedom Truth and History*, p. 173-4, and Errol E Harris, 'How Final Is Hegel's Rejection of Evolution?' in Stephen Houlgate (ed.) *Hegel and the Philosophy of Nature*, SUNY Press, pp.189-208, 1998, and Márcio Suzuki, 'Reproduction versus Metamorphosis: Hegel and the Evolutionary Thinking of his Time' in *History and Philosophy of the Life Sciences* 42. (2020).

⁵¹ Somers-Hall helpfully situates Hegel in terms of the debate between Geoffroy and Cuvier. See Somers-Hall, Henry, Hegel, Deleuze and the Critique of Representation, (New York: SUNY, 2012).

⁵² Karen Ng, *Hegel's Concept of Life: Self Consciousness, Freedom, Logic*. (Oxford University Press, 2020), p9.

Philosophical Sciences, namely in Knappik, and, opposing Knappik's account, that of Lindquist.⁵³ Their argument centers on whether or not Hegel can be considered an essentialist about species in his mature work. Instead, I focus on Hegel's early work in the philosophy of nature, to see the role he gives species with roughly the same set of scientific developments available to him as Schelling and Kierkegaard.

Hegel's critiques of taxonomic practices are often referenced briefly in overviews of the *Phenomenology of Spirit*.⁵⁴ A more detailed account has been given by Ferrini, who clearly outlines and contextualises Hegel's complex critiques of the logic of various practices.⁵⁵ My focus is slightly different, in that I wish to build up a more general picture of Hegel's account of species, and how it relates to that of Schelling and Kierkegaard, using his critiques in the phenomenology to illuminate and contextualise his remarks on the role of species in his Jena system sketches.

One issue in the background throughout is Hegel's relation to what is now known as naturalism. A naturalist reading is more likely to view species as either in nature, or indeterminate, whereas more metaphysical readings are more likely to view species as rationally constrained. Recently debates about whether or not Hegel can be considered a naturalist have come to the fore in anglophone scholarship. In brief, it has historically been common to hold that Hegel does not present a naturalist view, especially when he is interpreted as believing that spirit and or God are distinct from nature. A more recent incarnation of this position is to view Hegel as offering a challenge to contemporary naturalism, as in Papazoglou.⁵⁶ On the other hand, scholars such as Pinkard and Pippin⁵⁷ suggest either that Hegel presents a naturalist picture or that his philosophy is in some way compatible with (ontological) naturalism.⁵⁸ This debate is especially confusing because, as Papineau points out, there is no agreed upon definition of naturalism at play, and further, as Papazoglou notes, it is not a term Hegel would himself have made use of.⁵⁹ For our purposes what is important in these debates concerns how to understand the metaphysical status of species in particular; Hegel's methods are not, of course,

⁵³ Franz Knappik, 'Hegel's Essentialism. Natural Kinds and the Metaphysics of Explanation in Hegel's Theory of the Concept'. *European Journal of Philosophy* 24:4 (2016):760–787; and Daniel Lindquist, 'On Origins and Species: Hegel on the Genus-Process.' *Hegel Bulletin*, 41(3), (2020): 426-445.

⁵⁴ e.g. Jean Hyppolite, *Genesis and Structure of Hegel's Phenomenology of Spirit*, (Northwestern University Press, 1974) p.233; Richard Dien Winfield, *Hegel's Phenomenology of Spirit: A Critical Rethinking*, (London: Rowman and Littlefield, 2013) p.136.

⁵⁵ Cinzia Ferrini, 'Hegel's Confrontation with The Sciences In 'Observing Reason': Notes For A Discussion' *Bulletin of the Hegel Society of Great Britain* 55, (2007): 1-22.

⁵⁶ Alexis Papazoglou, 'Hegel and Naturalism'. *Hegel Bulletin* 33 (Spring 2012):74-90

⁵⁷ Terry Pinkard, *Hegel's Naturalism* (OUP: 2012), Robert Pippin, *Hegel's Practical Philosophy*, (Cambridge University Press, 2008).

⁵⁸ Following Papineau I think it is helpful to broadly distinguish discussions of naturalism that are methodological from naturalism regarding metaphysical entities. In Hegel scholarship, the discussion seems to me to be about the latter as it focuses on the relation between nature and *Geist*. see David Papineau, "Naturalism", *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL =<<https://plato.stanford.edu/archives/sum2021/entries/naturalism/>>.

⁵⁹ Papazoglou, 'Hegel and Naturalism'.

continuous with the methods of natural sciences even when they incorporate elements taken from the natural science of his contemporaries.

'Naturphilosophie' in the History of Science and Philosophy.

Schelling and Hegel both conceive of projects of *Naturphilosophie* as a science at different points in their careers. Both Schelling and Hegel also explicitly discuss the definition of this science – though Hegel will later express concerns to distance himself from ‘impoverished’ models of the philosophy of nature.⁶⁰ On the other hand, the other thinker I address, Kiemeyer, seems outwardly wary of the term *Naturphilosophie* and doesn’t call his own project – or any part of it – a ‘philosophy of nature’.

I think that it is important to acknowledge that this term can be used in various ways. Philosophy of nature, in a more general sense, could also be taken to mean any philosophical examination of nature, and some philosophical considerations of nature will not necessarily use the term ‘*Naturphilosophie*’ even if their projects or subjects of study are similar to those typically considered *Naturphilosophen*: thinking about the principles for understanding nature as a systematic whole. Because these are quite loaded terms and their boundaries are not clearly defined,⁶¹ this section introduces the historiographical issues pertinent to discussing philosophers or philosophies of nature around 1800.

As I noted above, attempts to retrospectively demarcate ‘legitimate’ *scientific* undertakings from *Naturphilosophie* imposes a standard that is anachronistic. Contra Lenoir, as Beiser points out, for example, “there was no clear distinction between philosophy and science in this period”, and that “there is only a distinction in degree and not in kind between Schelling, Hegel and Novalis on the one hand and Blumenbach, Kiemeyer and Humboldt on the other”.⁶² In addition, a clear-cut historiographical distinction between Kiemeyer, on the one hand, and Schelling and Hegel, on the

⁶⁰ In the ‘Introduction’ to the *Philosophy of Nature* part of the *Encyclopedia*, Hegel notes the ‘considerable lack of favour’ held by philosophy of nature and takes pains to distinguish his ‘science’ of philosophy of nature from other would-be proponents that he criticises for its disrepute. see Hegel, G.W.F., *Philosophy of Nature*, vol. III., edited and translated by M. J. Petry, (London: Allen and Unwin, 1970), p.191

⁶¹ First – whether and how is it to be distinguished from biological thought; second, how can it be distinguished from other historical works in philosophy dealing with nature (e.g. the presocratics, Leibniz); and how is it to be distinguished from natural science? In addition, should we take at face value either those who self-identify as *Naturphilosophen*, those who criticise *Naturphilosophie* and try to distance themselves from it?

⁶² Beiser *The Struggle Against Subjectivism*, p.10.

other, obscures the complexity of the positions at work in these thinkers and their interrelation, which scholars have now made clear.⁶³

Whilst *Naturphilosophie* has often (and sometimes with good reason) been a target of criticism – not only for its successors in science and philosophy, but for its self-acclaimed practitioners as well, we can't assume they all use the term in the same way, or that a definition was agreed on. In some cases it is used to refer to a distinctive method or science (Schelling, Hegel). In others, it seems to denote the kind of work done pertaining to 'nature' by a particular group of thinkers in a particular historical period, who are thought to share some common methods – such as a priori reasoning. Schelling gives his most clear discussion of the aim of philosophy of nature in the *Introduction to the First Outline of a Philosophy of Nature* (1799). As I will detail in chapter 5, Schelling's description of his philosophy of nature has two key aspects. To summarise, Schelling claims that philosophy of nature posits a 'Spinozism of physics' in which nature is 'self-existent', and consequently tries to explain 1) what is active within nature, the immanent cause of effects, to understand the necessity of the phenomena of nature. According to Schelling, this is at the same time 2) a derivation or understanding of part from or via the (systematic organic) whole. But there is no single definition of philosophy of nature understood and shared by all 19th century thinkers. This can be seen, for example, in Hegel's later complaints in 1817 that others have brought the idea of a philosophy of nature into disrepute, as they have not really – according to Hegel anyway – been doing philosophy of nature, because of the involvement of 'imagination and phantasy' rather than of 'the concept and reason'.⁶⁴ He mentions Schelling in particular, and refers back to his attacks from the introduction to the *Phenomenology*. In the *Encyclopedia*, he accuses Schelling's philosophy of being a 'prime example' of

crude empiricism and travestied thought forms, capriciousness of fancy and the flattest methods of proceeding according to superficial analogy, have been mixed into a complete chaos, and this stew has been served up as the idea, reason, science, divine perception. A complete lack of system and scientific method has been hailed as the very peak of scientific accomplishment.⁶⁵

Kiellmeyer, too, distanced himself from *Naturphilosophie*, but unlike Hegel, this was not accompanied by an explicit claim to be presenting his own version of it. The question of whether Kiellmeyer agreed with *Naturphilosophie* cannot be answered without defining what he took this term to mean. His relation to

⁶³ See e.g. Ferrini, 'From Disparagement to Appreciation: Shifting Paradigms', *Esercizi Filosofici* 9 (2014):1-13; Nassar, *The Romantic Absolute*; Richards *The Romantic Conception of Life*, Breidbach 1988; Beiser *German Idealism*.

⁶⁴ Hegel, G.W.F., *Philosophy of Nature*, [PN] v.III., edited and translated by M. J. Petry, (London: Allen and Unwin, 1970), p.192.

⁶⁵ Hegel, PN v. III, p.192.

Naturphilosophie is at least ambiguous: on the one hand he was dubbed ‘the father of *Naturphilosophie*’ and (as Grant points out) said that ‘the system of real-idealists seems consistent to me’,⁶⁶ he also distanced himself from ‘followers of Schelling’ in a later letter. Because of this, it is important to say what or who is being denoted in each case. Whether or not Kierkegaard is considered a proponent of *Naturphilosophie*, he is clearly influential on and influenced by philosophy, and thinking philosophically about nature, even though he does not announce his membership of a particular movement.

Of those who claimed to be doing philosophy of nature, thinkers also differed in the relative weight they gave to this method: e.g. as able to stand somewhat independently, as in Schelling’s accounts – he claims that explanation of reality must be able to proceed both from the perspective of transcendental philosophy and from philosophy of nature. For Hegel, though, philosophy of nature is envisaged as just one ‘sphere’ within a larger system of spheres, and in this system, nature proceeds from the ‘idea’.

Because of these many ambiguities, and because Schelling and Hegel had accounts of what they took philosophy of nature to be, I will try to specify how I am using the term when it appears.

Methodological Notes: Terminology

It is anachronistic to ask what ‘species concept’ Schelling (for example) had, if using such terminology implies a strict conceptual isomorphism between the boundaries of the concept of species now and in the past. Nowadays, the term ‘species concept’ is primarily used in philosophical and biological debates about the conditions for defining a biological species – the “fundamental taxonomic units of biological classification”⁶⁷, in a (post-Darwinian) context where evolutionary history is likely to play a role in species boundaries. In particular, according to Ereshefsky, in the contemporary context, discussion surrounds 1) what kind of thing species are, 2) whether there is only one true system of classification or not (species pluralism), and 3) whether species are ‘real’ (which is usually opposed to nominal). Whilst there will be some overlap between these questions and those of the thinkers under consideration in this thesis – particularly regarding point 1 – a goal of the thesis is to ask what kinds of question were pertinent to those *Naturphilosophen* at the turn of the century and to develop a picture of the meaning of these categories for them in the context of *Naturphilosophie* to develop a better understanding of that project. The scope of what is under consideration when ‘species’ is used is not identical for each

⁶⁶ see Kierkegaard GS, p.248., in Iain Hamilton Grant, *Philosophies of Nature After Schelling*, p.121.

⁶⁷ Ereshefsky, “Species” in the *Stanford Encyclopaedia of Philosophy* (2010). Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/sum2022/entries/species/>>

instance when it is used by these thinkers, and is less strictly defined than the way we tend to employ the concept now.⁶⁸

Because of this, here at the outset I should address terminology. At times throughout the thesis I will refer to ‘living natural kinds’ as well as ‘species’. The fuzziness of denotation is intended to reflect the fuzziness of the subject under consideration in the thesis itself:

First, the terminology of ‘species’ and ‘genera’ have had different historical senses and uses, and have come to have *both* logical and natural applications, according to what kinds of concepts, or entities are being divided and grouped.⁶⁹ To give some very brief background of terminology, whilst ‘genus’ and ‘species’ come to occupy the two lowest rungs of Linnaean classification, as I will explain further below, they also can be used relatively to denote a category (genus) and its subcategory (species) in any logical grouping.

In his study of the history of the idea of species, Wilkins suggests that rather than dividing the history of the understandings of species into prebiological and postbiological, which overlap, “we must separate universal and biological taxonomic notions of species”⁷⁰:

the history of the species idea that applies to any objects of classification—the tradition of universal taxonomy and philosophical logic—and, independently, the particular history of the species idea that applies solely to biological organisms⁷¹

I agree with Wilkins that there are difficulties with narrowing down the subject matter by dividing the history of species notions into pre- and post- biological; as if until a certain point in the late 1700s

⁶⁸ Equally, I think it is a mistake to think that there is no connection at all between any of the problems they were engaged with and the problems encountered today purely because they fall on the ‘bad’ side of the pre/post-Darwin dichotomy, not only because this project is intended to be historical rather than practical, but because focusing on how everything measures up against some later paradigm obscures what the important issues were to Kierkegaard, Hegel, Schelling.

⁶⁹ One further relevant term is *Typus*; this term had a number of senses in the period we are covering (often with surprisingly different scopes in terms of the kind of things which could be said to have a *Typus* – including kingdoms, individuals, particular organs – and with different degrees to which the *Typus* constitutes an independent reality of its own, and was also of great importance to thinkers such as Von Baer). My view is that despite the term’s important contextual connotations – in connecting the thinkers in question to others such as Goethe, for example – it does not raise any technical issues over and above those raised by their discussions of *Gattungen* and *Arten*. Both Schelling and Hegel do use the term *Typus*, but often interchangeably with any of the various terms used for a more general kind. It is clear that this usage distances them from viewing species as a nominal essence, abstracted from particular individuals, and that it has the connotation that being a member of that particular kind plays a concrete role in the nature and development of the individual. For example, Hegel uses *Typus* as opposed to *Gattung* in some of the texts I discuss (including in the passages where he discusses the ways species differentiate themselves from other species by means of their ‘weapons’ – their claws or teeth, for example). Accordingly, the discussions of *Gattungen* that take place throughout the thesis serve equally to illuminate their usages of *Typus*.

⁷⁰ Wilkins, *Species*, p.9

⁷¹ Wilkins, *Species*, p.9.

organisms received no special attention in classification. In my case this division would also be unhelpful due to the period under consideration here (around 1800), as biological and non-biological were not clearly defined, and the terminology and discipline of biology was in its nascent stages.

As to the second aspect of Wilkins' point, that we can consider the history of the species idea as it applies to organisms, this is helpful for sharpening the focus of my study, by pulling apart the broader issue of logical categories – “any naturally distinguished categories with an essence or definition”⁷² – from the taxonomy used in natural history. But on my part this is not to suggest that—especially for the philosophers of nature I address, Schelling and Hegel—these are entirely unrelated issues. Whilst I used this division as a starting point, it soon became clear that in his early writing, Hegel rarely uses ‘Gattung’ in a way divorced from the consideration of organisms, and equally, in their works around 1800, Kiemeier and Schelling share this focus on organisms or organisations.⁷³

Because of the complexity of these issues, I have chosen to primarily focus my study on the use of the term ‘Gattung’, the term Kiemeier, Schelling, and Hegel use in their discussions of nature to think about animals and plants.

Besides these two broad ways of approaching the question just outlined, a further ambiguity in the sense of the term ‘species’, is the breadth of the term in a given context. In Schelling and Hegel especially, it is often difficult to tell what exactly the scope of the term is meant to be, if any is even denoted by its use in a particular given context. For example, Richards claims that “Schelling used the term ‘species’—‘Gattung’ in German—in a very broad and rather vague way, so that a hyena, dog, and wolf would be regarded as varieties of the same species”.⁷⁴ This quote suggests again that care must be taken with the approach to this concept in the context of philosophy of nature. To try to mitigate this issue, I will look carefully at the use of the term in each thinker in the following chapters, and the questions they deem important regarding species and genera.

It might be objected that a thesis tracking the use of genus and species concepts in the life sciences in Schelling, Hegel, and Kiemeier is anachronistic in that it reads what have become ‘biological’ categories back into a time before they were used in that way, and had a more general sense. But it is clear that for these writers, the terms could have both a logical and a natural or life-science oriented

⁷² Wilkins, *Species*, p.9.

⁷³ I prefer to discuss ‘organisms’ or ‘organisations’ (the relation between these two terms will be addressed in the Kiemeier chapters) than to discuss ‘biological’ entities in the context of this thesis, where possible, because this is the terminology used by the philosophers I address. But I take it to approximate those plants, animals, etc who will be addressed by the discipline of biology as it develops.

⁷⁴ Richards, *The Romantic Conception of Life* p.301

application in their works. For example, Hegel's later work uses '*Gattung*' in both his clearly delineated 'logic' and 'nature' sections of his encyclopaedia. In Kiemeier and Schelling's texts, the context is predominantly in groupings of living natural kinds.⁷⁵

Put very briefly, the term 'species' in English is from the Latin use, which in turn approximates the Greek '*Eidos*'. Genus is the Latin form of '*Genos*'. The rough German language equivalents for these terms are, for genus, '*die Gattung*', and for species, '*die Art*'. But the terms are often used more loosely, without necessarily implying the nesting framework the Latin usages tend to involve – *Gattung* is sometimes used in a similar way to how we might use the term species, for example. As Wilkins points out when discussing the English terms, that with 'species', "different authors have meant forms, kinds, sorts, species, biological species, individuals, and collections"⁷⁶ – so again, the context must be paid attention to, and there is no strict one-to-one definition or translation. Because of this, one task will be to separate out uses applying to living nature, and seeing whether these are the same kinds of use as other uses of the species concept, i.e., whether there is anything special about categories of species and genus used in the context of discussion of types of organisms.

As I will elaborate in chapters 5 and 6, Schelling seems to have a clear idea of *Gattung* as a fixed level of variation that is discoverable via reproductive success, and his use of the concept is relatively consistent. This is not so clear with Hegel.

More generally, Hegel's early discussions of 'species' can seem unsatisfying from a contemporary perspective in that they are devoid of specific content and do not aim to give criteria for species or genus membership. A study of the use of '*die Gattung*' is also confronted with a lack of clarity about the breadth and consistency of the use of the term. There is no clear consensus among scholars as to the translation of *Gattung* – as genus, species, or kind – or even what is meant when Hegel uses it. Although I will show that the reasons for the most appropriate translation rely on interpretative and philosophical rather than primarily linguistic considerations, it is important to look at the issue more closely.

As Sell points out, there is good reason to think the following about *Gattung* in Hegel: that it "designates a universal which composes itself from species [*Arten*] or individuals".⁷⁷ This already suggests

⁷⁵ A further terminological note. I discuss 'organisation' and 'organism' further in chapter 3. But I would like to mention here that although in theory organisation can refer to various levels of system (organ, individual animal, etc), Kiemeier, Schelling and Hegel all most often discuss the relation between individual organisms (organisations, living individuals) and species. I interpret Hegel and Schelling as understanding 'organism' along post-Kantian lines (where parts and whole mutually presuppose each other) without the critical framework. As I will discuss in chapters 3 and 4, the case with Kiemeier is less clear.

⁷⁶ Wilkins, *Species*, p.11

⁷⁷ Annette Sell, '*Gattung*' in Cobben, Cruysberghs, Jonkers, and de Vos eds., *Hegel Lexikon*. (Darmstadt: 2006): 430-433.

that *Gattung* is (as it had been in its historic role as a logical term) relative and can be used by Hegel, as it is more generally, at different levels of generality rather than always the same rank as they are in a Linnaean context. Hence both 'genus' and 'species' are appropriate translations, depending on the context.

That said, I disagree with Lindquist's claim that it is a matter of indifference how we translate *Gattung* into English. I think that there are several issues with this. The first is that Hegel wants to use the connection of 'Gattung' to 'Begattung', as linked to reproduction and generation, and in this way attends to the notion of living beings. Hegel seems to almost always have in mind the sense of process when using *Gattung*, especially organic processes, as the most fitting understanding of the term. This could suggest that 'genus' would be a better translation because of its associations with reproductive (generative) processes. However, because the term is also used in Hegel's discussions of reproduction, where organic individuals recognise each other as belonging to the same *Gattung*, suggests (at least in these discussions) a more precise notion than genus, because the parents and potential offspring seem to require a type of identity that is more specific than genus.

In addition, Hegel will later claim, for example, that humanity is a *Gattung* – for that reason, I think that in most contexts, species is the most intuitive translation, as it is rarely juxtaposed in this Jena work with 'Art' to suggest a nested genus-species relation.⁷⁸ It isn't a term used in cataloguing and categorising, in taxonomic fashion. Because of this can't assume that the word is always being used in the same way, to denote the same level of generality.

Knappik's claim regarding Hegel's later *Science of Logic* is that "the notion of a 'natural kind' provides an apt rendering of Hegel's term 'genus'."⁷⁹ Knappik claims that Hegel's term 'genus' [*Gattung*] is aptly rendered as 'natural kind'⁸⁰ 1) because it doesn't reflect an artificial ordering of entities, 2) natural kind is a broad enough notion to be able to , and 3) it often accompanies 'a realist view of natural kinds' which he thinks aligns well with Hegel's use of objective concepts. As I hope to show, Hegel's most frequent use of this term in the Jena work is in a specifically organic mode, with occasional use in contexts of metaphysics or spirit. Therefore, not all natural kinds are *Gattungen*.

⁷⁸ But I think that 'kind' is also acceptable as it is able to denote what is passed down between generations in reproduction in English without seeming overly unusual.

⁷⁹ Knappik claims that there are three reasons why natural kinds and *gattung* can be aligned; first, because they are not artificial or merely subjective, but are a "matter of objective fact", second, because the term 'natural kind' is not restricted to substances but can include e.g properties, processes, and third, because belief in natural kinds in metaphysics is generally paired with realism about them, and with essentialism. See Knappik *Hegel's Essentialism*. 763-4.

⁸⁰ Initially Knappik says that genus is 'closely connected' with objective concept (p.762), then that 'the notion of a 'natural kind' provides an apt rendering of Hegel's term 'genus' (p.763) and 'hence an apt way of interpreting his notion of a conceptOBJ [objective concept]'.

It will become clear in the course of the Hegel chapters that:

1. In his philosophy of nature Hegel talks about the *Gattung* of an organic individual – as something belonging to individuals that is shared in some way, and
2. ‘*die Gattung*’ figures as what is reproduced or has a role in the individual’s various organic processes – Hegel attributes these to its *Gattung* rather than discussing its *Art*.
3. To talk about chemical substances, for example, Hegel uses ‘*Arten*’, not ‘*Gattung*’.⁸¹

So, because there are compelling reasons for either species or genus – or even ‘kind’ as the translation of *Gattung*, I have chosen to use species for the most part. But I will be sensitive to context given that the term does appear to be used more loosely and at times denotes something closer to ‘kind’.

Selection of material

My analysis in the Kiemeyer chapters will focus on Kiemeyer’s renowned speech given at the *Höhe Karlsschule* where he taught in Stuttgart in 1793, “On the Relations between Organic Forces in the Series of Different Organisations, and of the Laws and Consequences of these Relations”. This will be supplemented with material from his lecture notes and letters. The reason for focusing on his speech is that the 1793 version is the only piece of his work he published during his lifetime, so gives the clearest picture of the ideas he wanted to project. He also had influence directly, on many of his students, and indirectly, through the (sometimes illicit) circulation of copies of his speech and notes.⁸² It is difficult to pinpoint the precise extent of their circulation and influence, and how closely those materials matched what is available today. Later I will also refer to other materials (drafts and correspondence, for example), but the focus will be on Kiemeyer’s public statement of his views.⁸³

⁸¹ JS1 p.33 ‘der Gasarten’, and ‘Arten’ of ‘kristallinischen Gebirge’ (p.91).

⁸² See, for example, Susanne Lettow, ‘Generation, Genealogy, and Time’ in Susanne Lettow, *Reproduction, Race, and Gender in Philosophy and the Early Life Sciences* (Albany: Suny Press, 2015), p.31., and Zammito, *The Gestation of German Biology*.

⁸³ Interestingly, R. J Richards has suggested that perhaps the different versions of Kiemeyer’s speech are responsible for the divergent scholarly interpretations of Kiemeyer on this issue. There are two main versions of the speech available to scholars today: the originally published 1793 edition (reprinted by Kanz in 1993), and, what appears to have been more widely available before 1993, the 1938 *Gesammelte Schriften* put together by Fritz-Heinz Holler. Holler, the editor of the *Gesammelte Schriften* included an extra passage, written from the first-person perspective of “nature”, that does not appear in the 1793 publication. This passage, taken from Kiemeyer’s unpublished manuscripts, presents some points differently, as well as some points that are entirely absent from Kiemeyer’s authorised publication. The most initially striking aspect is this first person voice – which clearly seems to be used to draw the question of intention (and so issues of teleology) into focus: “Each of the organs that I [NATURE] just said I have formed the bodies of individuals from, I have so arranged, such that, according to your manner of speaking, each is reciprocally cause and effect of the other”. What is notable here is that although the language of intentions is

The main contexts in which Schelling discusses species in this period are 1) in his presentation of the series of organic formations, where he derives the possibility of individuals from the idea of nature as infinite productivity, and 2) in his discussions of embryology. I will focus on the works in which these are discussed, the *First Outline of a System of Nature Philosophy* and its 'Introduction' (1799), but also address some material from Schelling's *Von Der Weltseele* [On the World Soul], which was published a year earlier (in 1798). I have chosen to focus on these texts, first, because they are the ones in which Schelling seems most concerned with species and issues surrounding it. Further, they are places in which Schelling engages with Kierkegaard's thought and responds to it in a variety of ways, which is telling about Kierkegaard's influence, Schelling's development, and Kierkegaard and Schelling's differences. Thirdly, in these texts Schelling develops his idea of *Naturphilosophie* as a distinct science. That development and approach led to Schelling's approach having many professed followers and detractors, with Kierkegaard ultimately claiming in a letter that he did not endorse this approach. These texts have also been chosen because they can be seen as an intermediary between Kierkegaard and Hegel (as it is not clear whether Hegel had first hand familiarity with Kierkegaard's texts or only through Schelling and others).⁸⁴ As for why Schelling's later texts have not been analysed here, first of all, because the focus of my thesis is not on Schelling's overall philosophy but on the treatment of species in three thinkers at the turn of the 19th century, there is no need to address all of Schelling's works. In addition, keeping the analysis within a relatively narrow date range (1793-1807) means that all the texts considered have similar developments in natural science available to them.

Regarding Hegel, I will focus on discussions and use of the concept of *Gattung* in his 'Jena period' writings – roughly between 1801 and 1806, when he joined the faculty at the university of Jena as a *Privatdozent* and developed his philosophy up to the point of his publication of the *Phenomenology of Spirit* and his departure from Jena. I have chosen to focus on this period of Hegel's work for several reasons. First, there is relatively little scholarship on the *Jena Systementwürfe* texts, particularly in English,⁸⁵ most likely due to their status as lecture notes rather than published material – which opens up questions about the authenticity and authorship.⁸⁶ The early character of these works makes them

used ('I have arranged the organs so that...'), 'nature' is the 'I' here, not some agent external to it – such as a creator or contemplating individual.

⁸⁴ Although I will not argue for this here, it seems likely that Hegel was at least familiar with some of Schelling's works on nature, being as he will go on to criticise them in the *Encyclopaedia of the Philosophical Sciences*.

⁸⁵ Karin de Boer, *On Hegel: The Sway of the Negative* (Palgrave, 2010); Testa 'How does Recognition Emerge from Nature'; and Krell, *Contagion*, are notable exceptions of this neglect of the Jena writings in English language scholarship.

⁸⁶ That these texts are not yet completely translated into English may also exacerbate this neglect. Sections of material from Hegel's *Jena Systementwürfe* were added as part of the 'additions', along with Hegel's student notes, by Karl Ludwig Michelet when he was editing the *Encyclopaedia* in 1847 (after Hegel's death).

valuable: we see Hegel working on and finessing ideas. They show the debates and issues he was involved in as he attempted to formulate his own system.

In addition, because of the point in Hegel's career when these lectures are taking place, examination of his writings at this time offers insight into the relation between Hegel and Schelling. Hegel had become financially able to join Jena as a *Privatdozent* after his father's death and devote himself to the development of his own philosophy.⁸⁷ These lectures take place after Hegel's endorsement of Schelling over Fichte in the *Difference between Fichte's and Schelling's Systems of Philosophy* ['*Difference Essay*'], but before Schelling's departure from Jena, where passages in the *Phenomenology of Spirit* have instigated scholarly debates on his potentially changed relation to Schelling.

As well as explaining why I think it valuable to look at this part of Hegel's corpus, I should say a little to justify what has been left out of my investigation. Why stop at the *Phenomenology*, and why not focus instead on Hegel's 1817 or 1830 *Encyclopaedia* editions? Besides the reasons mentioned above that speak to the more general interest of these earlier writings,⁸⁸ for my project in particular, which focuses on responses to an issue around the turn of the century, to expand the timeframe too far beyond 1800 loses sight of the engagement with, and responses to, the confluence of theoretical and experimental developments that had arisen at the turn of the century. It also enables a comparison of responses between various philosophers of nature to roughly the same data and theoretical developments. In addition, much of the material in philosophy of nature dealing with species in Hegel's later work is found in the additional material, which muddies waters by virtue of being compiled from notes from various periods. Sections of material from Hegel's Jena *Systementwürfe* were added as part of the 'additions', along with Hegel's student notes, by Karl Ludwig Michelet when he was editing the *Encyclopaedia* in 1847 (after Hegel's death). Because Hegel intended his publication of the *Encyclopaedia* as only an outline, intended to be elaborated on in lectures, Michelet added these additional materials to aid the reader. The translations of Michelet's additional material in English language *Encyclopaedia* translations can obscure the different sources of the original material, as A.V. Miller's translation does.¹ This is noteworthy because it is unlikely that Hegel made no changes at all to any aspect of his thinking between 1802 and 1827, even in choice of what is referenced, but there is no way to tell if Michelet or Miller's are read. Petry's English translation of the 1830 *Encyclopaedia* includes Michelet's additions, attempting to signal their varying sources by use of subtly different typefaces. But it is not always clear which source is indicated and even if it is, does not show where the material is

⁸⁷ Horstmann, R. (1998). 'The development of the system: the Jena writings.' In *The Routledge Encyclopedia of Philosophy*. Taylor and Francis. <https://www.rep.routledge.com/articles/biographical/hegel-georg-wilhelm-friedrich-1770-1831/v-1/sections/the-development-of-the-system-the-jena-writings>. doi:10.4324/9780415249126-DC036-1

⁸⁸ (Besides the practical concern of having to limit my investigation to a feasible length).

located within it. I don't mean to suggest with these comments that the additional material is not helpful to a casual reader of the *Encyclopaedia*, but that it's hard to get a sense of Hegel's development, when he might be reacting to certain historical developments or contemporaneous positions, or any more general sense of the different contexts in which he makes certain statements and their consequent inflections. Finally, because Hegel's later encyclopaedic systems more explicitly separate logical from natural spheres, the strange status of species as an intermediary concept is lost.

As Horstmann summarises,⁸⁹ Hegel's systematic works of the Jena period can be divided into three groups of output: the first group contains his logic and metaphysics lectures, his *Über die wissenschaftlichen Behandlungsarten des Naturrechts* (1802), *System der Sittlichkeit* (1803), and the nature fragments from 1803/1804 (*Jenaer Systementwürfe I*).⁹⁰ The second group contains his 1804/1805 lecture notes on logic, metaphysics and philosophy of nature (*Jenaer Systementwürfe II*),⁹¹ and the third group contains the latest system programmes from this period – Hegel's 1805/6 lecture notes on philosophy of nature and spirit (*Jenaer Systementwürfe III*) and his preparations for the *Phenomenology of Spirit*. Of these, I will address 1) the 1803/4 nature fragments, 2) the philosophy of nature from 1805/6, and finally 3) the *Phenomenology of Spirit* (1806).

In these early system sketches and lecture notes, species are most often addressed in Hegel's discussions of 'organics' in his philosophy of nature notes from 1803/4 and 1805/6 (reproduced in *Jenaer Systementwürfe I* and *Jenaer Systementwürfe III* respectively).⁹²

Finally, in the 'Observing Reason' chapter of the *Phenomenology*, Hegel discusses genus and species several times, mainly as part of the development of an immanent critique of some way consciousness conceives of itself and its object – Hegel refers to these configurations as 'shapes of consciousness'. Because of the kind of work that the *Phenomenology* is, the discussions relating to species and genus concepts (and natural kinds more generally) are intended as immanent critiques of particular understandings of these concepts, rather than as Hegel advancing his own positive positions. These critiques appear mainly in the 'Observing Reason' section. I don't want to go too far into discussion of the goals of the *Phenomenology* or the movement between different stages of consciousness and their configurations, as it is not my aim here. Instead I will focus on what Hegel's comments on these shapes

⁸⁹ Rolf-Peter Horstmann, 'Einleitung' to JS3, p.ix.

⁹⁰ Georg Wilhelm Friedrich Hegel, *Jenaer Systementwürfe*, ed. Heinz Kimmerle and Klaus Düsing (Hamburg: Felix Meiner Verlag, 1971).

⁹¹ Georg Wilhelm Friedrich Hegel, *Jenaer Systementwürfe III, Naturphilosophie Und Philosophie Des Geistes*, ed. Rolf-Peter Horstmann (Hamburg: Felix Meiner Verlag, 1987).

⁹² this study is also intended to make possible a later comparison with the use of the concept as it appears in JS2, where it appears several times in his discussions of metaphysics.

of consciousness reveal about his criticisms of inadequate models of scientific method regarding classification. This will also reveal differences between what some method takes itself to be doing, and what, in Hegel's view, is really going on in this practise. The juxtaposition of his *Phenomenology* critiques with his prior lecture notes will enable a clearer understanding of Hegel's position on the issue of species.

A fuller examination of the role of the *Gattung* concept will not only illuminate its role in his Jena work and Hegel's position regarding these debates, but will also provide groundwork for future analysis of the relation between this and his later use of the concept, as well as the relation between logical and natural uses of concepts.

2: THEMATIC BACKGROUND

The present chapter will give an overview of key contextual developments relevant to our philosophers. This will introduce formative influences on the philosophies of nature under consideration in the thesis, providing context to the pertinent historical developments, philosophical issues, and historiographical obstacles. The chapter sets out the background of a series of themes that will be revisited in the coming chapters. It will address issues connected to understanding life and its properties that influenced Schelling, Kiemeier, and Hegel. The aim is to give an orientation as to the kinds of questions relating to *Gattung* that were important in the context in which Schelling, Kiemeier, and Hegel were writing. The following issues will be raised:

- i. Taxonomy: The Classification of Species
- ii. Nominalism and Realism
- iii. Continuity and Hierarchy
- iv. From Plenitude to Variation
- v. The History of Nature
- vi. The Role of The Species in Embryology
- vii. Natural Economies and Means-Ends Relations

i. Taxonomy

Foucault's controversial analysis⁹³ in *The Order of Things* singles out taxonomy as the main mode of classification in the 1700s, which fell out of favour in the shift to a modern *episteme*. Taxonomy groups objects together for the purposes of scientific study, and the most influential of these was Linnaeus' attempts to develop a universal taxonomy. As chapter 8 will show, an important stimulus to the philosophers under consideration was Linnaeus' work and the responses it prompted. This stimulus was not so much on account of the details of the particular divisions he saw in nature—which I won't focus on here—but of the principles behind them and in the goals of his project.⁹⁴

The first important point arising from Linnaeus' work is the goal of an ordered system that encompasses everything. He puts it as follows: "the Ariadne's thread of botany is system, without which botany is chaos".⁹⁵ As is well known, dissatisfaction with the unsystematic state of botany propelled Linnaeus to propose his own classification system in *Systema Naturae*, which was extended beyond plants to mineral and animal kingdoms in following editions and publications. Linnaeus distinguished (his) systematic taxonomy from 'synoptic' taxonomies, where synopsis "sets forward arbitrary divisions".⁹⁶ In differentiating his own systematic taxonomy from one which makes arbitrary groupings, Linnaeus suggests that the principle used for developing categories is to be applied consistently to achieve systematic results, and so, rather than conducting a complete empirical examination of all animals and plants to develop a taxonomic scheme, Linnaeus worked outwards from a principle of division to develop a systematic grid that showed all possible species. The principle of division was the criterion by which empirical individuals were judged to fit a certain species on Linnaeus' grid, for example, in

⁹³ See e.g. Marie Jahoda, 'Review', *Science Studies* Vol. 2, No. 1 (Jan. 1972): 99-101

⁹⁴ I have mentioned Foucault in the framing of my project because his work provides the most prominent precedent for claiming that taxonomy declined in importance in the period I treat. Because of this, I will briefly indicate here how my approach and findings differ from what is advanced in *The Order of Things*. According to Foucault's narrative, taxonomy is replaced by organic structural plans as the paradigm of natural science. Foucault assigns Cuvier a pivotal role in this transition away from Linnaeus. He is given this place because he questions the explanatory role of taxonomy, given that it focuses on apparent features rather than the "inaccessible" (p.267) connection between instances of a kind, the internal structures that make possible various organic functions. First, regarding my approach: I am not concerned to point out broad (or perhaps monolithic) changes in epistemes. Rather, I want to suggest that there is a commonality in the treatment of 'species' in Kierkegaard, Schelling, and Hegel, and that that commonality is philosophically interesting, but at the same time, I want to explore how they nonetheless all approach the issue in quite different ways. In addition, unlike Foucault, I do not want to make claims about what makes possible some or other later development (e.g. an aspect of Darwinian theory: Foucault wants to claim that it is Cuvier, rather than Lamarck, who makes possible the Darwinian concept of species – a conception of species as open to transformation). I'm more interested in the treatment of the issue in philosophy of nature, and what was interesting and distinctive about the approaches of these figures. As a side note, my thesis suggests that Foucault's narrative overemphasises Cuvier in certain respects. For example, the focus on internal structures because of their relation to organic function is also prominently found in Kierkegaard (who taught Cuvier), and Schelling and Hegel. Equally, the importance of the critique of taxonomic tables (as for example I address in chapter 8) leads me to question the prominence given to Cuvier.

⁹⁵ Linnaeus, *Philosophica Botanica*, section 155.

⁹⁶ Linnaeus, *Philosophica Botanica*, section 153.

botany the principle of division was based on plant reproductive organs; in particular, the number of stamens possessed by a flowering plant guaranteed a different species. This involves making a judgement about the significant feature or characteristic used in classification, and grouping organisms accordingly – giving priority to the intellectual scheme into which the empirical objects will be fitted. As will be developed later, the importance a method like this places on the presence or absence of some visible feature in the task of classification will come under criticism in Buffon and Kant,⁹⁷ and following them, Schelling and Hegel. As my later analysis will show, Hegel in particular is quite critical of taxonomic practises (chapter 8), and these practises are not of interest to Schelling’s treatment of species, or even Kiehmeyer’s discussion of the dynamics of the organic world.

The classification method he devised had five ranks or layers of nested categorisation: kingdom, class, order, genus, and species. Order, for example, seemed to be a category partly resulting from practical reasons: explaining his reasoning for subdivision of class, he claimed that it was much easier to distinguish a few, than many genera. Of these five ranks, he thought that species and genus were special in that they were ‘natural’: “That all genera and species are natural is confirmed by things that are revealed, discovered, and observed”⁹⁸. In this context, natural meant that genera (and species) were “made in the first place as it is”:

we reckon the number of species as the number of different forms that were created in the beginning”, he writes, “these forms have produced more forms according to the laws laid down, but always ones similar to themselves.”⁹⁹

For Linnaeus, this distinguishes the natural character of species from artificial hybridisations (as there are no new species), but also from *variation* within species, which is thought to be cultivated.¹⁰⁰ This also signals Linnaeus’ species fixism, in that he (in his earlier writing, such as *Systema Naturae*) held that new species have not arisen over time and that there are the same number as there were in the beginning.¹⁰¹

Given this five-rank system and Linnaeus’ commitment to the idea that species and genera were natural, he did not use ‘species’ and ‘genus’ as logical categories relative to whatever is being discussed, as had

⁹⁷ As Huneman notes, in the Critique of Judgment, Kant “questions the particular analogy between the internal constitution of members of the same species—the objectivity of grouping individuals having the same appearance within the same species” Huneman, *Understanding Purpose: Kant and the Philosophy of Biology*, p.5.

⁹⁸ Linnaeus, *Philosophica Botanica*, section 159

⁹⁹ Linnaeus, *Philosophica Botanica*, section 157

¹⁰⁰ “Species and genera are the work of nature; variety is often the work of cultivation; class and order are the work of nature and art.”: Linnaeus *Philosophica Botanica*, section 162.

¹⁰¹ In his later publications, as a result of his experiments, he was forced to accept the possibility of hybrids – see Frans Antonie Stafleur, *Linnaeus and the Linnaeans*, (Oosthoek, 1971), pp. 136-138 for a discussion of Linnaeus views on hybridisation in his work.

been common in post-Aristotelian medieval logic, but as fixed concepts denoting the two lowest groupings. This had the result that ‘species’ was used to denote *infimae species* only, rather than any subcategory relative to some higher ‘genus’, and this also meant that species could not themselves be genera, ‘species’ thereby coming to denote something absolute.

Linnaeus himself acknowledged that his method prioritised fitting things into the system (once he had decided upon it) and consequent classification proceeded post-factum as described above, fitting new discoveries into his existing scheme. Because of this, he distinguished the artificial character of his own systematisation from the real, divinely imposed system of nature. What this reveals about Linnaeus’ method is significant. As Bowler explains, for Linnaeus, “the first step... was to reduce chaos to a semblance of order by imposing an artificial system, but the ultimate goal of his enterprise was recognition of the true natural order.”¹⁰² In this respect, he was a realist about species and genera, even if he thought that in its current state there may have been an incompleteness to the current state of his taxonomy.

Finally, as Wilkins points out, Linnaeus initially used the metaphor of “discrete” and “distinct” countries with shared borders to conceptualise the arrangement of species.¹⁰³ This suggests that he (at least initially) rejected the notion that species graded into each other in numerous and fine distinctions. Though he did not accept this finely graduated model of the relations between species, that species meet at the ‘borders’ of countries means that there are no ‘gaps’ to be had, for ‘nature makes no leaps!’ (*Natura non facit saltum*).

Whilst Linnaeus struggled to accommodate hybrids into a scheme where number of species and genera were fixed and constant, as well as their boundaries, Buffon—particularly in his early¹⁰⁴ phase—represents a contrasting approach. For Buffon, the phenomena of nature appear in a multitude of very fine grades:

nature, proceeding by unknown gradations, cannot wholly lend herself to these divisions... there will be found a great number of intermediate species, and of objects belonging half in one class and half in another. Objects of this sort, to which it is impossible to assign a place, necessarily render vain the attempt at a universal system¹⁰⁵

¹⁰² Peter Bowler, *The Fontana History of the Environmental Sciences*, p.163.

¹⁰³ Linnaeus, *Philosophia Botanica* section 77.

¹⁰⁴ Farber and Eddy develop this periodisation, as summarised in Wilkins, *Species*, p.75.

¹⁰⁵ *Histoire naturelle*, 1749, p13, 20. in Lovejoy p230, in Wilkins, *Species*, p.75.

Here, Buffon distinguishes the neat divisions into discrete species (of the kind favoured by Linnaeus) from the way that nature is thought to be in reality, which proceeds by ‘unknown gradations’. This distinction presses on two important points of debate that will be important throughout the thesis, the nominalism/realism debate, and discussions about the continuity of nature.

ii. Nominalism and Realism

By stating that only individuals exist and that nature doesn’t really fit into our discrete species notions, Buffon aligns himself on the opposing side to Linnaeus in the older nominalist-realist philosophical debate about the reality of classifications of the natural world.

Put very briefly, the opposition between nominalist and realist positions is not restricted to the issue of living species, or even to natural kinds, but has also encompassed discussions about any sorts of universals, including ‘secondary qualities’ like colour.¹⁰⁶

The aspect of this debate most relevant to my thesis is about whether species classifications are merely a conventional linguistic matter of convenience, or are somehow a feature of or contained in our concepts, or are instead correlated to a deeper reality they try to reflect. The nominalist position, held by William of Ockham and Abelard in the medieval period, and revisited in different forms in others such as Bacon and Locke, holds the view that universals exist in the understanding (or even language) alone.¹⁰⁷

Locke’s view – the most commonly cited representative of a modern position on these issues – was reminiscent of nominalism because he thought that the mind bound things “into bundles, and rank them into sorts”, for the purpose of communication.¹⁰⁸ But, as Wilkins points out, whilst Locke thought that names denoted abstractions, he still thought that there were real essences that we can’t really know. He denied, therefore, “only that the essences of kinds, or sortals [...] agree to anything else but nominal essences”¹⁰⁹. A species would on this account be an “artifice of the understanding”, made by the mind, though there are also real species in nature.¹¹⁰

¹⁰⁶ In Gonzalo Rodriguez-Pereyra’s succinct account, for a realist a ‘universal’ can denote properties, relations, or kinds. *Stanford Encyclopedia of Philosophy* (2015).

¹⁰⁷ According to some classifications of these views, what is referred to as nominalism here includes both nominalism proper (that universals exist only as names or words in language) and conceptualism (that universals exist in the understanding, but not in things thought about). Realists take universals to exist in the things themselves, although – to add a little nuance to Wilkins’ account – they too can be empiricists, and say that our knowledge of universals is obtained by abstraction from experience.

¹⁰⁸ Locke, *Essay Concerning Human Understanding*, Book 3, chapter 5, section 9.

¹⁰⁹ Wilkins, *Species*, p. 63

¹¹⁰ Locke, *Essay*, Book 3, chapter 5 section 9.

Buffon's rejection of the reality of species was accompanied by a realism: one about individuals. He claimed that not species, but individuals are the genuinely real basic units. As noted above, Buffon objected to Linnaeus, holding instead that "nature, proceeding by unknown gradations, cannot wholly lend herself to these divisions"¹¹¹. This was accompanied by the view that individuals alone exist in nature, and so, species divisions were thought to be made by applying a rubric to nature that was not its own.

Buffon instead used a working idea of species that defined species as those organisms that had reproductively viable offspring – which was something that was subject to being empirically tested. This was later also followed by Kant in his distinction between the description of nature (*Naturbeschreibung*) and natural history proper (*Naturgeschichte*) in his anthropological works.¹¹² As Huneman notes,¹¹³ a proper natural history was thought to be historical insofar as it took into account the "hereditary criterion of species" proposed by Buffon, noting filial relations, rather than a system such as Linnaeus', which was thought of as artificial because it made categories according to presence of a certain feature or number of that feature, and then looked to the world to categorise objects, rather than looking at the ways in which individuals interacted and then approximating these interactions with the idea of species, as Buffon did, by looking at reproductive success as his criterion.¹¹⁴ This notion was clearly influential for Schelling and Hegel, who both stress the genealogical continuity of species. But, as I will discuss in chapter 5, Schelling will retain this idea as a potential 'test' of species identity, it is not key to his ontological definition of species but instead is an effect of his ontological position that has more to do with how we come to know species differences and less to do with his account of its ontological foundation.

iii. Continuity and Hierarchy

The second, more important issue opened up by Buffon's opposition to Linnaeus, and emphasis on the multiplicity of grades in nature, requires some explanation of the way the configuration of nature was construed more broadly in different thinkers. By configuration, I mean the way that nature is understood to be divided (either artificially, or really) into different categories with different features

¹¹¹ Buffon, *Histoire Naturelle*, (1749) p.20; in Lovejoy, p.230.

¹¹² Buffon, *Histoire Naturelle*, (1749) p.20; in Lovejoy, p.230.

¹¹³ Huneman, *Understanding Purpose: Kant and the Philosophy of Biology*, p.8

¹¹⁴ To clarify: Linnaeus acknowledged his system was artificial but thought that it was based on true principles and tracked something real. Buffon criticised the neatness of Linnaeus' divisions, initially holding that only individuals really exist, later that only species did, and that species were categories established empirically (via the possibility of fertile offspring).

IDEE D'UNE ECHELLE
DES ETRES NATURELS.

L'HOMME.
Orang-Outang.
Singe.
QUADRUPÈDES.
Ecureuil volant.
Chauve-souris.
Auruche.
OISEAUX.
Oiseaux aquatiques.
Oiseaux amphibies.
Poissons volans.
POISSONS.
Poissons rampans.
Anguilles.
Serpens d'eau.
SÉPENS.
Limaces.
Limaçons.
COQUILLAGES.
Vers à tuyau.
Trépan.
INSECTES.
Gallinées.
Tens, ou Solitaires.
Polypes.
Orues de Mer.
Sentiveux.
PLANTES.
Lichens.
Mouffures.
Champignons, Agarics.
Truffes.
Coraux & Coralloides.
Lithophytes.
Amianthe.
Talcs, Gyps, Sépénies.
Ardoises.
PIERRES.
Pierres figurées.
CrySTALLATIONS.
SELS.
Vitriols.
METEAUX.
DEMI-METEAUX.
SOUFFRES.
Bismuth.
TERRES.
Terre pure.
E A U.
A I R.
F E U.
Matières plus subtiles.

Fig. 2

regarding how they relate to one another. Lovejoy's influential schema in *The Great Chain of Being* is helpful for delineating some of the notable features of the configuration of nature in different thinkers. Very briefly, Lovejoy's work traced variations of the great chain of being concept, paying special attention to two principles: the principle of continuity, and the principle of plenitude.

To return to Linnaeus' early discrete 'countries' understanding of species, for example, the borders between species are thought to conceptually 'touch', in that there are no possible intermediate classes or 'countries' between the two under consideration.¹¹⁵ The taxonomic debates of the 1700s often turn on the sense in which nature is thought of as *continuous*. In the context of the natural world, a continuum signals the lack of gaps between kinds or between individuals. More commonly, claims about the continuity of kinds was accompanied by the notion that division into classes and species actually cut up what was a more continuous chain.¹¹⁶ In either view of the chain of being, each link touches the next.

A continuum is thought to be 'graded' insofar as the steps on the continuum are considered 'higher' or 'lower' than each other. Of course, there could be hierarchical understandings of the configuration of nature's kinds without subscription to the idea of continuity. But whether continuous or not, the vertical aspect of a graded series of kinds of being was prevalent when Kierkegaard, Schelling, and Hegel appeared on the scene. The most prominent example of the use of a hierarchical graded series to understand the natural world in the late 1700s was Charles Bonnet's¹¹⁷ example in the *Traité d'insectologie*, 1745 (see fig. 2).¹¹⁸ In Bonnet's scale (*Echelle*), kinds are represented in a linear series stretching from 'subtle matter' (*Matières plus subtiles*) to humanity (*l'homme*).¹¹⁹ In a hierarchy of this kind, the degree of branching signals whether or not kinds can occupy the

¹¹⁵ Lovejoy claims that "nature does not make separate kinds without something in between them, the lowest number of one genus borders the highest member of a lower" *The Great Chain of Being*, p. 79.

¹¹⁶ For example, in Leibniz' nominalist position, only individuals really exist, yet he used the notions of ladder and chain.

¹¹⁷ As noted in Georg Toepfer ed., Bonnet was also one of the first to use the term 'hiérarchie' in respect to organised nature in 1770 (hierarchy was initially a term from a theological context). *Historisches Woerterbuch der Biologie*, p. 117

¹¹⁸ Charles Bonnet, 'Idée d'une Echelle des Etres Naturels', *Traité d'insectologie*, 1745.

¹¹⁹ These hierarchies of beings echoed older hierarchies - like that of Alexander Pope, where the idea that the series of beings is divinely ordained is stressed - *An Essay on Man*, (J Wilfred, London, 1734)

same level, i.e., whether there can be differences that are non-hierarchical expressed by the diagram (which is not the case between objects for Bonnet). The principles by which the series is hierarchically graded (and the objects could be compared) was often *complexity*. This complexity could be spelled out in different ways with different emphases, but broadly followed the Aristotelian tradition, which compared the capacities of kinds: in book II of *De Anima*, Aristotle presented the capacities of the different groups of beings (plant, animal, human) as a nested hierarchy whereby the higher entities have all the capacities of the lower groups, in addition to their own distinctive ones. So humans, for example, were thought to have rational souls or capacities, but to also possess the reproductive capacities of plants and the locomotive capacities of animals as well.

iv. From Plenitude to Variation

To return to Linnaeus for a moment: Linnaeus' early claim regarding the shape of nature, that nature has no leaps, rejected the possibility of unrealised species gaps between potential kinds and actual kinds. With this claim, according to Lovejoy, Linnaeus adopts a version of the principle of plenitude.¹²⁰ This is a requirement that all conceptual possibilities are necessarily realised in actuality – nature is full or complete. Linnaeus' conceptual scheme was thought to have predetermined the possible number of genera, so where no corresponding kind existed, it would have to be explained as as yet undiscovered. But as more and more empirical evidence of hybridisation mounted, and Linnaeus changed his view to accept the possibility of new species arising from older ones, the continuity and plenitude of Linnaeus' system of nature was instead ensured by being manifest in time: as Bowler writes, Linnaeus “eventually postulated that in the beginning, god had created only a single species in each genus – all others we now observe had been created in the course of time by hybridization between the original forms.”¹²¹

This indicates that, when it comes to the difficulties posed by hybrids for Linnaeus' early thought, what the meaning of diversity is and how to account for it were important issues. The development of a species in different directions on account of its interaction with the environment did not of necessity entail a belief in the emergence of new species from old or species transmutation. The judgement of what constitutes a *variation within* a species as opposed to a new species was key. The characteristics of the environment in which an organism developed was widely accepted to play an important role in

¹²⁰ As Lovejoy describes, plenitude is a neo-platonic concept that has its roots in Plato's *Timaeus* dialogue and was taken up by many neoplatonic thinkers, in which the intelligible archetype of the universe (including its forms of plants and animals) is actualised or expressed as a result of the productivity of the good or 'the one', where in this emanation is that it is 'necessary that all possibilities' become actualised.

¹²¹ Bowler, *A Fontana History*, p. 180.

giving rise to the development of variation. Such variability on account of the conditions of its locale, sometimes called ‘horizontal’ species development, was often distinguished from the further enumeration of species due to an empirical test, such as the production of fertile offspring, or, as was the case for Linnaeus’ eventual acceptance of certain hybrids as in fact new species, the inability of the new (horizontally developed) form to reproduce with the parent species.

More generally, I’d like to mention two issues that arise here. First, the unification of a multiplicity of different capacities in one kind, or unification of diversity, will be an influential point for the philosophers discussed in the following chapters. I will suggest that elements of this idea of the unification of multiplicity can be found in Kiemeier, Schelling, and Hegel, that an examination of their treatment of species reveals different weight being placed on this idea’s import.

Another point about variation that is pertinent to the philosophical discussions in the thesis is the degree of variety present *within* species, and whether this distinction (between species and variety) can be meaningfully made (as Darwin will later question).¹²² In the 1700s, some of the preoccupations about this question surrounded the formation of a typology of ‘races’ and are thus significant to the history of racism.¹²³

v. The History of Nature and its Emergence in Relation to Species

Linnaeus’ early claim that there are ‘as many species as there were in the beginning’ avoided the question of the differences between the natural world as it was in the past and as it is now, and the question as to how the natural world (as it appears now) emerged.¹²⁴ But such strategies that avoided explaining the emergence of the natural world or the changes it undergoes were increasingly faced with the need to find explanations for empirical findings that appeared to suggest the age of the earth was much greater than had previously been supposed, and that there were significant differences between the indications given by the remnants of the past and the world as it is now. Geological history showed potentially quite different historical conditions, which would have to be inhabited by different organisms, or at the least, different forms of extant organisms. Ammonite fossils – if accepted as organic remains – posed one example of an empirical finding that seemed to bear no close extant relatives, and

¹²² Darwin will claim that the term species “does not essentially differ from the term variety” and is a matter of convenience. As Ereshefsky notes, among other reasons, Darwin thought that “the distinction between variety and species was built on ideas concerning creation” [SEP]. he also rejected fertility of individuals or sterility of individuals as potential criteria to distinguish variety from species. Ereshefsky: ‘Darwin’s solution to the species problem’. *Synthese*.

¹²³ Typologies were connected to the arguments for monogenesis – that humans have a shared genealogy, as Kant and Buffon argued. For a discussion of these issues and the history of racism, among other topics, see e.g. the collection *Reproduction, Race, and Gender in Philosophy and the Early Life Sciences*, By Susanne Lettow, ed., (Albany: SUNY Press, 2014).

¹²⁴ Linnaeus eventually came to reject his earlier claim that the number of species had remained constant.

required explanation. As Bowler writes, “however constant the laws of nature, the earth itself had changed through time and could only be studied by methods analogous to those of the historian who seeks to reconstruct the human past from fragmentary records”¹²⁵. Even assuming constancy in the laws of nature, changes in the state of the world need to be explained.

Literature about the history of species often considers evolution – especially as conceived of by and after Darwin – as the main form of change, with transmutation as its precursor. But of equal, if not more import to the thinkers in this thesis are the issues surrounding other forms of change: extinction, metamorphosis, and degeneration.

Where nature is headed in the future will be a significant point of discussion, especially as this relates to species. Extinction of kinds is an especially important issue for Kiehmeyer, as will be shown in chapter 4. Whether or not such events occurred at all, and if they did, whether it was only due to artificial human intervention, or ‘naturally’ or necessarily without human interference, was an important issue that had an impact on beliefs about the necessity of events in the world and its plenitude. What such events could mean, for Kiehmeyer, about the history of nature and the contingency of natural forms will be contrasted to Schelling’s and Hegel’s respective views in chapter 5 and my concluding chapter. On the scale of the individual, rather than species, metamorphosis is an important process Schelling spends time discussing, as well as using the fact of metamorphoses as evidence for or against certain other views about nature and species (chapter 5). Not only whether significant historical changes were thought to occur in nature’s species, but also, whether or not change was thought to be progressive was another important question. The various responses of Kiehmeyer, Schelling, and Hegel to this issue will be examined further throughout.

vi. Embryology and Species

This issue draws us into territory that will be especially important when discussing Schelling’s use of the concept of species in chapter 4 – the potentialities held by an individual and the relation between those potentialities, its species membership, and the environment in which the individual develops. Much of this discussion focuses on embryology and the debates that were taking place in embryology at the end of the 1700s. The debates about embryology, in particular, epigenesis-preformation debates and their consequences for conceptions of species, will be examined there.

¹²⁵ Bowler, *A Fontana History*, p. 215

Variants of preformationist accounts were held by Swammerdam, Albrecht Haller, and Charles Bonnet, some of which influenced similar notions found in Leibniz, Malebranche, and others. The key idea of preformationism can be summarised as asserting that a delineation of the mature form of the plant or animal already lay in the seed in advance of that animal or plant's realisation.

In its most basic form, this idea could be understood as a fully articulated preformation of the organism in the seed, which is thought to develop through the expansion of that preformed individual.

Something of this sort had been proposed in some early preformationist theories, such as Nicolaas Hartsoeker's homunculus theory.¹²⁶

However, there is clearly room for various interpretations of the way the mature form could be contained in the seed on a preformationist account. On Swammerdam, RJ Richards notes that in fact, this pre-existence of the mature form -

did not mean that the semen carried an actual physical miniature-though his later readers so interpreted him. He [Swammerdam] held, rather, that the generative material was predelineated 'in ideas and types according to a rational similitude'.¹²⁷

We will see in chapter 4 that when Schelling criticises preformation, he understands the 'form' implied in the sense of *morphé* rather than the sense of *eidos*: that is, he holds the preformationists to be advancing a figural preformation rather than an intelligible or ideal one. Although in the quotation above, Swammerdam says that he should be interpreted as holding that the generative material was delineated 'in ideas and types', his use of empirical findings as proof may nevertheless suggest that he at the very least anticipated empirical correlates of preformation of parts in figure. It seems Schelling took preformationists to be advancing a figural preformation because he criticises it not only on rational but also on empirical grounds – i.e., that microscopy has not proven preformationism correct with the discovery of tiny figures.

Views opposing preformationism instead held that embryological development occurred through a process of 'epigenesis'. Epigenetic positions of various types were held by C.F. Wolff, Blumenbach, and prefigured in Aristotle. Rather than the unfolding and expansion of preformed parts or wholes from a seed, epigenetic theories explained the development of organisms as a gradual or sequential process, in which the organism became increasingly differentiated and determinate as it developed from an

¹²⁶ Nicolaas Hartsoeker (1694).

¹²⁷ Richards, *The Meaning of Evolution*, p.7.

unformed state (rather than mere expansion of what was already fully determinate). Because epigenesist thinkers like Blumenbach and Wolff could not explain the articulation of nature's kinds as (physically) pre-existent since creation, it was necessary for adherents of this position to find another way to explain how the organism was progressively formed.

In Aristotle's picture, the coordination of formal and final causes explained the direction of growth to a particular form, but the rise of mechanistic philosophy had made explanations with recourse to formal and final causes increasingly unpopular. As Stephane Schmitt notes, the resurgence in epigenetic theories in Blumenbach's period "came within the framework of the general progress of teleology in physiology at that time"¹²⁸ His concept of the *Bildungstrieb*, the formative drive, in turn "suggested that organic matter had a natural tendency towards self-organization under certain conditions"¹²⁹ – and so is understood by a separate force. In C.F. Wolff, the *vis essentialis* performed this function; and in Blumenbach, the *Bildungstrieb*. These vitalist accounts therefore posited that the forces governing animate nature are of a different kind to those mechanical causes that comprised physical processes (this debate will be explained further in the chapter 6 below).

vii. Natural Economies, Means-End Relations, Mutual Determination

A further prominent theme in the post-Linnaean landscape is the 'economy' of nature. Whereas taxonomies tended to be rather abstract, static classification of kinds, such taxonomies were often (at least in Linnaeus' case) developed alongside an investigation into the economy of nature. Unlike taxonomies, economies were meant to describe the relations of dependency between entities in the world. Originally such economies had a theological character – in Linnaeus, and in William Derham before him, the economy of nature described the divinely ordained balance instituted between the habitats, predation relations, and reproductive productivities that were thought to sustain the variety of kinds in nature – for human benefit. Economies of nature thus placed great importance of means-ends reasoning to explain the way the natural world operates. For example, the plants live so that the aphids may eat them, and so on. Egerton quotes Linnaeus as follows:

...all living creatures should constantly be employed in producing individuals; that all natural things should contribute and lend a helping hand to preserve every species; and lastly, that the death and destruction of one thing should always be subservient to the restitution of another.¹³⁰

¹²⁸ Stephane Schmitt, 'Epigenesis and Transformation' in *Pander's Biology*, p.3.

¹²⁹ Schmitt, 'Epigenesis and Transformation', p.3.

¹³⁰ Linnaeus 1775:40, 1977, quoted in Egerton, F.N. (2007), *A History of the Ecological Sciences*, Part 23: Linnaeus and the Economy of Nature. *The Bulletin of the Ecological Society of America*.

As will be shown in the Kielmeyer chapter, the economy model that initially accompanied a picture of the natural world in which there was no change in the number of species over time was taken up and transformed into 1) a more flexible system that was able to account for changes such as species extinction, and 2) a system whose functioning did not require an external creator as having instituted the order, as in e.g. Linnaeus' scheme. As will become clear in later chapters, Schelling and Hegel will both ridicule the use of external teleology in reference to nature, of the sort described above: that for example, explains the existence of coconuts by reference to their use-value to humankind, because it involves recourse to a supernatural explanation of nature. But, on the other hand, the formation of economies of nature are significant in Hegel, Schelling, and Kielmeyer's discussions of species because such economies try to describe a system in motion composed of active processes. The necessity of interconnections in an understanding of the world (and its natural kinds) as an interrelated whole puts the understanding of system held by Schelling and Hegel at odds with the understanding of the meaning of system Linnaeus held, which is more a collection of operations than a necessarily unified whole.

Finally, because my thesis suggests that Kielmeyer, Schelling, Hegel, move beyond Kant's development of the notion of 'organic' in his Critique of Judgement in various ways, this should also be mentioned as important background information. I outline Kant's views in chapter 3.2. For now, I want to stress that the Kantian framework involves discussions of teleology that involve the 'mutual determination' of parts. The development of the idea of mutual determination without the Kantian critical philosophical framework, as well as without the focus on individual organism, to new ways of conceiving of the species-individual relation, I suggest, was important for Kielmeyer, Schelling, and Hegel.

Summary

This chapter has introduced some of the background themes that Schelling, Kielmeyer, and Hegel worked against.

PART I: KIELMEYER



fig. 3: From Saverio Manetti, *Ornithologia Methodice Digesta, Atque Iconibus Aeneis Ad Vivum Illuminatis Ornata*. *Storia Naturale Degli Uccelli*. Vol.4, (Florence, 1776) <https://doi.org/10.5962/bhl.title.60851>



fig. 4: 'Night Heron', John James Audubon, *The Birds of America*, Vols. I-IV, 1827-1838 (1835), Plate 236.

Special Collections, University Library System, University of Pittsburgh.

https://commons.wikimedia.org/wiki/File:236_Night_Heron_or_Qua_bird.jpg;

<https://digital.library.pitt.edu/islandora/object/pitt%3Aaud0236>

The overall hypothesis about Kielmeyer I advance in the following two chapters is that he exemplifies a shift in the understanding of species, not only from 1) a static to a historical understanding, but further, from 2) an atomic, substance-model understanding of individual species members to a less subject-centred model, and to 3) understanding species in terms of interrelations rather than internal properties.

At the same time, I will show Kielmeyer's approach makes his views on the further debate over his ontological commitments and the kinds of causality that holds in reality in the organic world impossible to discern. What is significant, given these ambiguities, is that Kielmeyer seems to think that he can give a systematic account at the organic level, regardless of its possible reduction to the inorganic – an account that can be internally coherent without having to make any strong claims about anything outside itself.

Finally, whilst Kielmeyer's 'comparative physiology', or analysis of proportions of force was significant for Schelling (and Hegel, following Schelling) I will point out some respects in which Schelling – owing to his own philosophical commitments – did not really appreciate an important aspect of Kielmeyer's work. Although Kielmeyer was amenable to certain kinds of hierarchy in the organic world, his particular model of equilibrium and compensation of forces suggests that ultimately his system is less hierarchical.

¹³¹ Chapters 3 and 4 contain substantial sections of material that I have published in a paper: Lydia Azadpour, 'Kielmeyer's Economy of Extinction', in Azadpour and Whistler eds, *Kielmeyer and the Organic World: Texts and Interpretations* (London: Bloomsbury, 2020).

Chapter Outline

This chapter introduces Kiemeier and outlines the aims of his best-known work, “On the Relations between Organic Forces in the Series of Different Organisations, and of the Laws and Consequences of these Relations” (1793).¹³² As I will elaborate, Kiemeier’s main intent is to explain the ‘course and persistence’ of the organic world – including its species – by referring to an equilibrium of organic forces.

Throughout the chapter, I will argue that whilst Kiemeier puts forward bold hypotheses to answer this question, he uses technical terms, such as ‘force’ and ‘organisation’, quite broadly and flexibly. In a similar vein, I will suggest that the debate which has framed much of recent discussion of Kiemeier – about his application of the notion of purpose – could be seen as an effect of Kiemeier’s deliberate ambiguity and flexibility regarding not only his claims but the meanings of terms, perhaps in order that his hypotheses might appeal to different intellectual camps.¹³³

First, this chapter will clarify what Kiemeier means by these various terms – forces, organisations – in their historical context, in order to better understand the goals of the speech. I argue that Kiemeier’s use of ‘force’, as well as his description of the purposiveness or apparent mutual determination in the organic world, are both employed with the provisos that these are ‘makeshift’ or ‘according to our way of speaking and representing’, rather than making specific ontological commitments, beyond the claims that organisations are *structures that are the results of ongoing processes*, or activities. Even in his apparent employment of Kantian vocabulary, Kiemeier’s system gives different emphases: he often focuses less on individual organic substances and more on the general dynamics of forces at a higher level.

The second part of the chapter will sketch the debate in Kiemeier scholarship about his application of the notion of purpose – whether it is in a Kantian mode of enquiry, or if instead Kiemeier gives an alternative approach. I agree with several recent scholars who have pointed out that the historical divisions made by Lenoir, particularly with regard to the identification of this research programme, categorises thinkers in an unhelpful way for understanding their thought and the contemporary

¹³² It was his most widely circulated too – at the time, unofficial copies were being shared among intellectuals in Germany, yet Kiemeier was apparently reluctant to publish, and had to be persuaded to publish his manuscript. For details of the historical background, see ‘Kiemeier’s Fame and Fate’, in *Kiemeier and the Organic World* (London: Bloomsbury, 2020).

¹³³ As Kanz outlines, Kiemeier’s speech was wildly popular in his intellectual context, despite only publishing one paper in his lifetime. ‘Kiemeier’s Fame and Fate’, in *Kiemeier and the Organic World* (London: Bloomsbury, 2020).

intellectual landscape.¹³⁴ But on the subject of how exactly Kielmeyer's thinks of teleology (particularly regarding how 'Kantian' it is), I suggest first, that this debate has in part been complicated by scholars using the notion of 'regulative' with different meanings, but more importantly, the fact that this debate has taken hold in the literature may reflect Kielmeyer's experimental attitude, employing bold working hypotheses about phenomena without making specific ontological claims that have broader traction. Rather than focus entirely on the terms prescribed by this debate, in this chapter I will deal with the 'Lenoir thesis'¹³⁵ (and Kielmeyer's relation to Kant) in the context of the question of what Kielmeyer wanted to explain and the intended scope of his explanation regarding his claims about organic nature.

¹³⁴ See discussion of scholarship on Kielmeyer in the scholarship review above.

¹³⁵ Lenoir, *The Strategy of Life*.

3.1. Introduction to the aims of Kielmeyer's Speech

For Kielmeyer, the 'organic world' [*die Organischen Welt*], comprises of what he refers to as 'organisations' [*die Organisationen*] or 'living individuals' – also described collectively as 'animate nature' – and their 'forces' [*die Kräfte*]. Kielmeyer's main contention is that laws can be found that appear to govern the relative distribution of these forces in organisms, and that these laws can be used to understand the course and persistence of the organic world. To explain this, the speech focuses on answering several questions:

first, which are those forces that are united in the greatest number of individuals; then, what are the proportions of these forces to each other for different species of organisations, and according to what laws these relations modify themselves in the series of different organisations. And finally, how effects and consequences previously alluded to – namely the development and continued existence of this organic world, and the species that compose it – are grounded in them [the forces] as their cause.¹³⁶

In answer to the first question, Kielmeyer lists five forces: sensibility, irritability, reproduction, secretion, and propulsion¹³⁷. He asserts that these forces are found in differing proportions in different species, different individuals, and in the same individual at different times in their lifespan. Briefly, of the forms of organic force Kielmeyer outlines – sensibility, irritability, reproduction, secretion, and propulsion – three are adopted from physiologist Albrecht von Haller,¹³⁸ with the addition of two further forces, secretion and propulsion. These were thought to characterise behaviours and functions of organisations: sensibility, the reception of sense perceptions; irritability, response to nervous stimulation; reproduction, the regenerative and reproductive abilities of organisations; secretion, the ability of plants and animals to secrete fluids in particular places of their organisation; and propulsion, the ability of the organisation to move.

Forces

It seems clear, at least at first glance, that these forces are peculiar to living, "animate" [*lebendige*] nature, and describe kinds of living functions. Sensibility, irritability, reproduction, secretion, and propulsion

¹³⁶ RF, p.31

¹³⁷ RF, p.32

¹³⁸ Haller taught Blumenbach at Göttingen, where Kielmeyer later visited.

are not used to describe features of inanimate nature; yet it is not immediately clear what Kiemeier means by force, or why he selects these forces as the basis of his account.

So, what might Kiemeier mean by 'force' [*Kraft*]?¹³⁹ This question would be expected to bear on determining the ontology at work in Kiemeier's scheme, the status of 'the organic' on his account, and as a consequence, the ontology of his account of species. Kiemeier's explanation of the concept of force is a bit enigmatic. He writes that: "If we organise the effects we perceive into classes [according to their similarities and differences] and designate these effects or their causes 'forces' [...]"¹⁴⁰

According to this initial indication, each of these terms describes a category of effects that we perceive in organisations. For example, "irritability" denotes various perceivable effects, such as the observation of a limb exposed to a fire being automatically moved away, a reflex motion in a muscle fibre. But he also says that these forces can denote the underlying, unperceived cause of these effects: for example, the passive potential that the organism has that if exposed to a fire, the irritability of the organism would excite certain muscles to move the limb away. When describing each force, he writes that each is defined as a certain "capacity": e.g. "the capacity of some organs – above all the muscles – to contract on occasion of excitement and produce movements".¹⁴¹ Further still, Kiemeier uses the term not only to refer to potencies and their actualisation, but also sometimes to refer to the organ that possesses the power, as for example in his discussion of reproductive organs.¹⁴²

Kiemeier's term can thus denote both a power, the actualisation of a power, and the organ itself. By contrast, for Christian Wolff (1679-1754), whose usages were crucial for the standards of philosophical usage in this period, *Kraft* is to be clearly distinguished from capacity (*Vermögen*). In Wolff's definition of *Kraft*, it is "a source of changes, a striving to do something must be found in it"¹⁴³ - not a mere capacity, but refers to actualisation and expression. In Kiemeier, the term is used more loosely, and can denote both the actualisation or instantiations of force, as well as causes of these expressions. Because of the breadth of his use of the term, the ontological status of the forces Kiemeier identifies is unclear – it seems deliberately so. Many of Kiemeier's phrases suggest a provisional attitude to his hypotheses, his

¹³⁹ For an alternative account of Kiemeier as presenting an 'analogical Newtonianism', see Andrew Cooper, 'Force and Law in Kiemeier's 1793 Speech' in *Kiemeier and the Organic World*, pp. 81-98.

¹⁴⁰ RF, p.32

¹⁴¹ RF, p.32

¹⁴² Thanks to Henning Tegtmeier for bringing this point to my attention.

¹⁴³ Wolff writes: "E.g., when I sit, I have the capacity to stand up, for it is merely possible that I can stand up. But if I actually want to stand up and someone holds me back against my will, a power of standing up is expressed in me. A change is merely possible according to a capacity; through power it becomes actual. And for that reason a self-subsisting thing can bring about something that was merely possible" (§114, 115). Christian Wolff: 'Rational thoughts on God, the world and the soul of human beings; also all things in general (1720)', in Eric Watkins, *Kant's "Critique of Pure Reason": Background Source Materials* (Cambridge: Cambridge University Press, 2009). p.19.

discussion of force is no exception. He writes, for example, that his use of the concept of force is “makeshift”¹⁴⁴, and that he proposes five forces unless they are somehow able to be “cancelled by a higher understanding”¹⁴⁵, suggesting that their categorisation into five kinds is not absolute. In this he remains open to the possibility that we may perceive differences where there are in fact expressions of a unified power of some kind. And further that it is acceptable for the time being, and even “conducive”¹⁴⁶ to postulate hypotheses in a provisional way. This could either suggest a scientific, experimental outlook to his provisional hypotheses, indicate epistemic humility of some kind, or put him on the side of advocating a merely heuristic understanding of things. But I think that he perhaps deliberately holds back from outlining the ontological status of his ideas – perhaps this was intentional in order to have his ideas taken seriously across the intellectual landscape of the time. Likewise, the openness of Kiemeier’s discussion of forces – as able to refer to the capacity *or* the effects insofar as we observe and group them – makes his views on the further debate over the kinds of causality that holds in reality in the organic world impossible to discern.

Because Kiemeier holds that the development and existence of the organic world (including its species) are grounded in these organic forces, it is important to consider the possibility of reducing organic force to inorganic forces on his account: are species identities only able to be understood on the organic level? Put another way – how do the forces discussed by Kiemeier in this essay relate to other forces, if there are others? It seems clear, at least at first glance, that these forces are peculiar to living, “animate” nature. Kiemeier was undoubtedly influenced by Blumenbach, and if the forces of living nature are of a fundamentally different kind or origin to the others, then he might also be considered a proponent of vitalism: Blumenbach held that the formative force [*Bildungstrieb*] was “not referable to any qualities merely physical, chemical, or mechanical.”¹⁴⁷ However, in contrast, it is not clear that Kiemeier believed that these forces were ultimately unconnected to mechanical or chemical ones, due not only to the provisional phrasing of his writing but also to a hint he gives, when discussing the reproductive force, that it *could* be seen as a distinguishing feature of organic beings if it were not the case that “as in previous cases [it could] be sufficiently demonstrated, that it too sprung from inorganic nature and can be derived from forces internal [to the inorganic realm]”. Again, this openness leads to alternative stresses in the scholarship; Lefèvre and Klein claim that Kiemeier, “in principle, also believed in a chemical explanation of the processes of life”, in his early work at least.¹⁴⁸ But he did not yet think that

¹⁴⁴ RF, p.32

¹⁴⁵ RF, p.32

¹⁴⁶ re. chains of means-end relations. RF, p. 31.

¹⁴⁷ J.F. Blumenbach, *Elements of Physiology*, p.27.

¹⁴⁸ “The Epistemic Elevation of Vegetable Commodities”, in Ursula Klein and Wolfgang Lefèvre, *Materials in Eighteenth-Century Science: A Historical Ontology* (Cambridge, MA: MIT Press, Cop, 2007) p.252. Klein and Lefèvre point out that later in the 1800s, he thought that the elements constituting an organism “could only be destroyed, but not created, by chemical art, since chemical art is not in command of the forces necessary for their resynthesis”.

chemistry was at a stage where it would be able to achieve such an explanation, according to Lenoir.¹⁴⁹ What is significant, given these ambiguities, is that Kielmeyer seems to think that he can give a systematic account at the organic level, regardless of its possible reduction, an account that can be internally coherent without referring to anything outside of it.

“Organisations” and The Organic Machine:

From a contemporary perspective, it might seem a little unusual that Kielmeyer mainly discusses ‘organisations’, rather than ‘organisms’ in his speech – this terminology is no longer in common use. Kielmeyer does also use the term ‘organism’ three times in his speech. The contexts of these uses indicate respectively (1) that the organism of a living individual is made up of a system of organs,¹⁵⁰ (2) that ‘organism’ is the bearer of systems, such as irritability and sensibility,¹⁵¹ and (3) that ‘organism’ is that in which systems or kinds of force are united.¹⁵² For Kielmeyer, ‘organism’ at least emphasises a key aspect of living *individuals* – here, that they are composed of systems of organic force. This move towards its referring to individual or particular organisms was not widespread at the time. Cheung has credited Kielmeyer and Oken with being the first to “systematically use the term ‘organism’ [*Organismus*] as a generic name for individual entities”,¹⁵³ demonstrating a new use of the term that is “focused on the ‘material individuality’ of the ‘organism’ as a specific form of Dasein and Organisation.”¹⁵⁴ For the most part, however, Kielmeyer discusses ‘organisations’ (always in plural) – various things, living beings, which are ‘organised’.

Strangely, Kielmeyer’s emphasis on *organisations* – despite much argument about his use of teleological reasoning – has not been remarked upon in the literature. What are these ‘organisations’ under consideration: what characterises them? Around this time, the emphasis on organisation would have

¹⁴⁹ Lenoir writes that Kielmeyer “conceded that the French chemists had made advances in the chemical analysis of plants and animals. But he added that the chemical analysis of organic materials was still in its infancy, and further that no satisfactory application of chemical methods to the general theory of organisation could be expected in the near future.” Timothy Lenoir, *The Strategy of Life*.

¹⁵⁰ “Each of the living individuals thus animated by their organs endures for a greater or lesser stretch of time, and at each point in this course of time, the system of effects that we call its life, and the system of organs that makes up its organism, change themselves, one emerging from the other as its cause.”; i.e. ‘organism’ refers to the arrangement of the parts rather than the ‘substance’ itself; organism is a feature or description of the individual. RF, p. 30.

¹⁵¹ “The duration of irritability and its independence from the other systems of the organism in the series of organisation from men down increases rather than decreases”, RF, p.36.

¹⁵² Kielmeyer adds that “The more united all the kinds of expressions of reproduction there are in an organism, the more the faculty of sensibility is excluded”. RF, p. 41.

¹⁵³ Cheung, *From the organism of a body to the body of an organism*. p.335.

¹⁵⁴ See also Karl Friedrich Kielmeyer, *Gesammelte Schriften*, ed. Fritz-Heinz Holler (Berlin: Keiper, 1938), p.20.

suggested not only a particular structure¹⁵⁵ of the phenomenon under consideration, but also that this phenomenon itself is the result of a process or activity. These aspects of ‘organisations’ – as a structure that is an activity or process – can be seen clearly in Kielmeyer’s introduction of the description of the interrelations of organs in a system. Kielmeyer defines ‘Organisations’ as phenomena that manifest a certain structure: an organisation is spatiotemporally ‘animated by its organs’ in such a way that

each organ is so adapted to the changes of all other organs and so united in a system of simultaneous and consecutive changes that according to our manner of speaking, each is reciprocally cause and effect of the other.¹⁵⁶

Kielmeyer’s description of the ‘organic world’ as a larger whole shares this description of its structural and processual character with that belonging to particular organisations. So we know so far that an organisation is 1) a certain kind of structure, and 2) a structure that is the result of ongoing processes or activities. There is of course more to be said about what Kielmeyer thinks of as organisations (and thus as components of the organic world – and members of species); we must now address the possible connotations of Kielmeyer’s understanding of the processual structure of the organisations that make up his ‘organic world’. This in turn will involve consideration of the major scholarly debate to date regarding Kielmeyer – that of his precise relation to Kant.

¹⁵⁵ See e.g. entry ‘Die Organisation’ in *Deutsches Wörterbuch von Jacob und Wilhelm Grimm*. 16 Bde. in 32 Teilbänden. Leipzig 1854-1961. Quellenverzeichnis (Leipzig 1971).

¹⁵⁶ RF, p. 30.

3.2. Kielmeyer, Kantian Science, and Teleology

Kielmeyer's claim above about organs in an organism – that each is “reciprocally cause and effect of the other” – echoes Kant's discussion in of organised beings in the *Critique of Judgement*, where he says that “we must think of each part [of a product of nature] as an organ that produces the other parts (so that each reciprocally produces the other)”.¹⁵⁷ Kant's discussions of scientific topics, especially in the *Metaphysical Foundations of Natural Science*, and in the *Critique of Judgement*¹⁵⁸, (both of which Kielmeyer had likely read¹⁵⁹) were hugely influential in the late 1700s.¹⁶⁰ Because of this similarity in explanation of ‘organised beings’ in Kant to ‘organisations’ in Kielmeyer, and in addition, because literature referencing Kielmeyer has often responded to Lenoir's framing of the debate, which focused on Kielmeyer's manner of employing teleology, addressing Kielmeyer has often focused on discerning the metaphysical position, if any, at work in his view of the causality at work in living individuals, especially regarding the use of teleological reasoning. Broadly, the debate is over whether Kielmeyer is thought to employ the notion of purpose in line with a Kantian mode of enquiry, or if instead this is something he rejects in favour of an alternative approach. This issue bears on our topic insofar as the character of these natural operations – the teleology involved in them – is part of the understanding of ‘organisations’ as Kielmeyer conceives of them. As I mentioned in my overview of scholarship, Lenoir has argued that a unified research programme of “teleomechanism”¹⁶¹ can be discerned from Kant and Blumenbach through Kielmeyer, Reil, Treviranus, and others. For Lenoir, teleomechanism is a methodology distinct from reductive mechanism and from vitalism. Two key strands of Lenoir's work with respect to Kielmeyer are:

- i) the interpretation of Kielmeyer as a Kantian employing teleology in a regulative manner (though Lenoir also claims that Kielmeyer “as a biologist found it difficult to remain consistent with the regulative use of this principle”¹⁶² and ended up using it constitutively in the end), and
- ii) a historical story in which Kielmeyer forms part of this teleomechanist research program and as a

¹⁵⁷ CJ §65, p.253

¹⁵⁸ Kant, *Critique of Judgement*. ‘Erste Fassung der Einleitung in die Kritik der Urteilkraft’, Werke, vol. 5, p. 181n., in Richards, RJ., ‘Kant and Blumenbach on the Bildungstrieb’, in *Stud. Hist. Phil. Biol. & Biomed. Sci.*, Vol. 31, (No. 1, 2000): 11–32.

¹⁵⁹ See G. Jaeger, *Ehrendächtniss Des Königl. Wurtembergischen Staatsraths von Kielmeyer*, (S.L, 1845).

¹⁶⁰ For an overview of the huge influence of just two of the sections of the *Critique of Judgement* on Goethe, Schelling, Hegel, etc., see Eckart Förster, ‘The Significance of §§76 and 77 Of the Critique of Judgment for the Development of Post-Kantian Philosophy (Part 1),’ *Graduate Faculty Philosophy Journal* 30, no. 2 (2009): 197–217.

¹⁶¹ This division between those that belong to a Kantian research program from those that do not is often used to stress the legitimacy of Kielmeyer's place in the history of the life sciences over against the “bold metaphysical speculation” of *Naturphilosophen* like Schelling. This demarcating historiographical agenda has already been criticised by Nassar, Schmitt, and others.

¹⁶² Lenoir, *The Strategy of Life*, p.58.

member of this research programme is singled out as the line of ancestry for more recent, properly scientific achievements.

Regarding point ii), I agree with recent scholarship that the historical divisions made by Lenoir, particularly with regard to the identification of this research programme, categorises thinkers in an unhelpful way for understanding their thought (I discuss this further in the literature review). My position on point i), however – regarding the extent of Kiemeier’s Kantian outlook on teleology – is more complicated, requiring further explanation, insofar as the debate bears on Kiemeier’s ontological commitments re. his understanding of “organisms” and the “organic world”.

To understand the stakes of this issue requires a brief sketch of Kant’s discussion of teleology towards the end of the *Critique of Judgement*. There, as is well known, Kant deals with both the manner and extent to which we can legitimately employ the idea of purpose in the consideration of nature. Of particular interest for our purposes is his discussion of ‘inner material objective purposiveness’¹⁶³ (‘material’ as opposed to formal because it deals with empirical nature *outside us* rather than the formal aspects of space and time,¹⁶⁴ ‘inner’ because it is thought to inhere in the phenomena under consideration). Regarding its extent, Kant questions the application of the idea of purpose in consideration of i) particular natural entities (“organised beings”¹⁶⁵, or “natural purposes” (§65-66)) and ii) nature as a whole (§67). Regarding the manner, what is under discussion is whether the concept of teleology can be employed in a ‘constitutive’ manner, a ‘regulative’ manner, or not at all with scientific legitimacy in our judgements about natural phenomena. This discussion was of special import given the context of mechanism as new paradigm of explanation in science from the Cartesians to the later French materialists. A short overview of these issues will contextualise the discussion of Kiemeier’s reception. Does this use of apparently Kantian terminology mean that Kiemeier’s understanding of the organic world is also Kantian? And if so, what would that mean?

Natural Purposes and their Scope

Firstly, the question of purpose itself. For Kant, to consider purpose in this context is to consider phenomena as forming means-ends relationships, as goal-directed. To use this concept would be to use a concept outside of the realm of mechanical explanations, which function according to efficient

¹⁶³ Also called absolute material objective purposiveness

¹⁶⁴ See Robert Wicks, *Guidebook to Kant on Judgement* (London; New York: Routledge, 2007). p.190.

¹⁶⁵ ‘organisierte Wesen’.

causality. In a mechanical explanation, the end is not presupposed in order to explain the means; an efficient cause can be considered by itself without reference to some effect. Or, as Kant puts it:

a causal connection, as our mere understanding thinks it, is one that always constitutes a descending series (of causes and effects): the things that are the effects, and that hence presuppose others as their causes, cannot themselves in turn be causes of these others. This kind of causal connection is called that of efficient causes¹⁶⁶

In a teleological or goal-directed explanation, by contrast, there is a closer interrelation apparent between the cause and effect such that the cause is in some way oriented towards the effect; the effect thus being in some sense presupposed in the cause: as Ginsborg puts it, something is an ‘end’ for Kant “if we regard it as produced by the causality of a concept”.¹⁶⁷ But the use of teleological reasoning is therefore far more easy to understand in the context of human activities where intent and planning are involved where a concept plays a clear role in the generation of the object. The kind of teleology under consideration in organised beings (*Naturzweck*) thus differs from other teleological understandings of causality – e.g. human crafting of objects – in that the concept or cause is not clearly *external* to the phenomena under consideration. In thinking about organised beings, Kant says at that “Nature organises itself”.¹⁶⁸ By contrast, the purpose we might note in an intentional act, for example, when a basket is conceived of and then woven, the concept in the mind of the artisan is apart from the material phenomena that it may work on. In addition, the concept of a basket can exist in the mind of the artisan whether or not it is actually woven. Such considerations lead Kant to outline two conditions¹⁶⁹ of judging a thing to be a natural purpose: not only should it be the case that 1) “the possibility of its parts (as concerns both their existence and form) must depend on their relation to the whole”, but also that 2) “the parts of the thing combine into the unity of a whole because they are reciprocally cause and effect of their form”.¹⁷⁰

The requirement that the existence and form of the parts are *possible only in relation to the whole* makes an organised being difficult to explain via mechanical principles alone. In a watch, for example, though the parts are all configured so as to produce the effect of telling the time – a given cog doesn’t depend on the whole or on the other cogs for its form or being. By contrast, as in the famous Aristotelian example, a hand cut off is no longer a hand. Put another way, it’s hard to imagine or think about an organic part

¹⁶⁶ CJ §65, p.251.

¹⁶⁷ Hannah Ginsborg, ‘Kant’s Biological Teleology’ in *A Companion to Kant*. (Blackwell 2010), p.457.

¹⁶⁸ CJ §65, p.251.

¹⁶⁹ „...ein Ding existiert als Naturzweck, wenn es von sich selbst (obgleich im zwiefachen Sinne) Ursache und Wirkung ist;“ KU §65.

¹⁷⁰ CJ §65, p.251.

arising without (prior) reference to some whole of which it is part. Examination of the interrelations of the parts seems to lead to a concept which would in turn need to be presupposed in order to explain those parts. As Kant describes this aspect elsewhere, “a whole whose concept (in a being possession the causality in terms of concepts that would be adequate for such a product) would, conversely, be the cause of this body according to a principle”.¹⁷¹

The second condition is a little more ambiguous, but goes in the other direction (from parts to whole). As Ginsborg explains it, “the parts are produced and combined into a whole by one another”¹⁷².

Kant not only considers particular organised beings using the concept of *Naturzweck*, but also discusses nature as a whole, as containing interrelations that make it appear as if it were purposively structured.

With Kant’s analysis of natural purposes, not only the conditions to be fulfilled for making a judgement (as I have just outlined), but also the manner in which the judgement is used, is of key importance, and forms an important feature of the debate in Kilmeyer scholarship. Kant holds that the judgement of organised beings as being natural purposes should be taken in a particular way. Kant claims that the attribution of the concept of *Naturzweck*, given the fulfilment of the conditions above, is a matter of “reflective judgement” applied “regulatively”: “Teleological judgement is reflective, and its principle is regulative”.¹⁷³ What does this mean? Very broadly, the first stage of this claim, for Kant, is that there is...

clearly a difference between saying that certain things of nature, or even all of nature, could be produced only by a cause that follows intentions in determining itself to action, and saying that *the peculiar character of my cognitive powers* is such that the only way I can judge those things are possible and produced is by conceiving for this production a cause that acts according to intentions, and hence a being that produces in a way analogous to the causality of an understanding.¹⁷⁴

The emphasis then is on the requirements of the investigator into nature and their requirements for being able to think of something – in this case, an organism – as possible. We are not dealing with ontological claims about the nature of reality itself considered apart from the thinking subject.

Reflective Judgement

¹⁷¹ CJ §65, p.252-3.

¹⁷² Ginsborg, ‘Kant’s Biological Teleology’ p.457.

¹⁷³ CJ §78.

¹⁷⁴ CJ §78.

Further, what does the claim that such judgements are reflective actually mean for Kant?¹⁷⁵ In claiming that the application of teleology in this context is a matter of what he calls ‘reflective judgement’, Kant signals that these judgements proceed in a certain manner: rather than beginning with a concept already to hand, and then applying this to experience, reflective judgement must search after a concept under which to subsume some given experience. “[O]nly the particular is given” he writes, “and the universal has to be found for it”¹⁷⁶. There is therefore a posteriority to the use of the concept here. So because no concept is already given in constituting the natural purposes, judgement has to reflect – to compare or combine concepts, and to understand natural purposes by analogous use of the reasoning. He writes that in a reflecting judgement, “reason determines only [how I must] use my cognitive powers commensurately with their particularity and with the essential conditions imposed by their range and limits”¹⁷⁷. For Kant, we can unify experiences that make up an organism, for example, by analogously using the concept of purpose (previously related to intentions, as discussed above) outside of the realms of human intentional planning. For Kant, to get to the universal concept (e.g. a *Naturzweck*) from the given particular (e.g. a particular organised being) requires utilisation of a principle which is arrived at through reflection. In the case of judgements of natural purpose, the principle is considered to be a ‘regulative’ one.

Regulative Principles

What is entailed, in Kant’s schema, by claiming that a principle is regulative, or to be used regulative way? Prior to the examination of organised beings in the *Critique of Judgement*, Kant had discussed ‘regulative’ use of ideas in the *Critique of Pure Reason*: there, in the context of scientific judgements,¹⁷⁸ regulative use of the ideas served to direct the understanding...

towards a certain goal upon which the routes marked out by all its rules converge, as upon their point of intersection. This point is indeed a mere idea, a focus imaginarius, from which, since it lies quite outside the bounds of possible experience, the concepts of the understanding do not in reality proceed.¹⁷⁹

¹⁷⁵ The “capacity for reflecting on a given representation according to a principle”.

¹⁷⁶ Kant, Introduction to *the Critique of Judgement*, IV., cited in Howard Caygill., *A Kant Dictionary* (Oxford: Blackwell, 2008). p.129.

¹⁷⁷ CJ §75.

¹⁷⁸ Here I am following Robert Hanna’s description of this distinction in ‘Supplement to Kant’s Theory of Judgement’, (Stanford Encyclopedia of Philosophy),” Stanford.edu (2017), <https://plato.stanford.edu/entries/kant-judgment/>.

¹⁷⁹ CPR, A644/ B672.

In the *Critique of Judgement*, the use of regulative principles seems to be presented similarly insofar as they operate in the acknowledgement of the limits of the understanding.¹⁸⁰ Kant writes, for example, that the

concept of a thing as in itself a natural purpose is not a constitutive concept either of the understanding or of reason. But it can still be a regulative concept for reflective judgement, allowing us to use a remote analogy with our own causality in terms of purposes generally, to guide our investigation of organised objects and to meditate regarding their supreme basis – a meditation not for the sake of gaining knowledge either of nature or that original basis of nature, but rather for the sake of that same practical power in us by analogy with which we were considering the cause of purposiveness in organised objects.¹⁸¹

We can glean from the above Kant quotation that regulative concepts are, first, to be distinguished from constitutive ones. Second, that, as I have indicated, they involve reflective judgments in order to find a concept to apply (in this case, analogously). But several difficulties present themselves in understanding precisely what Kant has in mind with *regulative* principles, in part due to his differing descriptions in the *Critique of Pure Reason* and the later *Critique of Judgement*. Accordingly, scholars often use different emphases when defining constitutive principles. For example, Caygill describes constitutive principles as those that “seek to bring the existence of appearances under rules a priori”¹⁸², whereas Hanna defines the constitutive use of judgements is one in which “its meaning, truth, or legitimacy as a “principle” (*Grundsatz, Prinzip*) is not based on any further assumptions, hypothetical conditions, or suppositions”¹⁸³. Without delving too deeply into Kant scholarship here, because of these terminological complexities, I would like to focus as far as I can on how Kant describes the regulative use of *Naturzweck* in the immediate context of the *Critique of Judgement*. We can draw, especially from the above quotation, is that Kant emphasises the use of the concept of *Naturzweck* as a ‘helpful guide’ in our investigation of objects. But the precise sense of ‘helpful guide’ – whether it is to demote or to inflate the role of teleological judgement, receives different emphasis among Kant scholars (and consequently those addressing the role of Kantian philosophy in Kiellmeyer).

How important is a regulative principle?

¹⁸⁰ The emphasis is a little different. Here (in the *Critique of Judgement*), there is no claim made about what does or does not happen beyond the bounds of possible experience.

¹⁸¹ CJ, §65 p.255.

¹⁸² CPR, A 179/ B221, in Howard Caygill, *A Kant Dictionary* (Oxford: Blackwell, 2008). p.129.

¹⁸³ Robert Hanna, ‘Supplement to Kant’s Theory of Judgement’, (Stanford Encyclopedia of Philosophy),” Stanford.edu (2017), <https://plato.stanford.edu/entries/kant-judgment/>.

Whilst Kant does claim that the principle isn't constitutive, he still claims that it is based on an a priori principle, and is a *universally necessary maxim*. In this way, it is still held to be an indispensable component in our thinking about natural objects: Kant writes that...

if we want to investigate the organized products of nature by continued observation, we find it completely unavoidable to apply to nature the concept of an intention, so that even for our empirical use of reason this concept is an absolutely necessary maxim.¹⁸⁴

Why is it unavoidable, or, an absolutely necessary maxim? For Kant, we simply cannot conceive of the possibility of organisms without using this principle. But further, we would face difficulties in making scientific investigations without presupposing this principle. Not because, as noted above, consideration of the 'supreme basis' of teleology in nature as a whole (in Kant's case, the thought of the divine creator) helps us gain scientific knowledge of the organised beings, but that using the teleological principle in considering particular organisms as natural purposes can help further our scientific investigation of them. For those scientists...

who dissect plants and animals in order to investigate their structure and gain insight into the reasons why and to what end these plants and animals were given those very parts [...] this maxim is inescapably necessary – i.e., the claim that nothing in such a creature is gratuitous. They appeal to it just as they appeal to the principle of universal natural science, namely, nothing happens by chance. Indeed, they can no more give up that teleological principle as give up this universal physical principle.¹⁸⁵

The reason why I have devoted a few words to the sense of regulative principles in Kant is that scholars of Kierkegaard also discuss the 'heuristic' use of teleological principles when dealing with judgements of *Naturzweck*, without clearly distinguishing the senses of heuristic and regulative. Kant continually describes the role he gives to judgements of *Naturzweck* as unavoidable – so much so that it is responsible for an antinomy of judgement a few paragraphs later in the third critique.

Very briefly, the antinomy of judgement¹⁸⁶ rides on the seeming contradiction between understanding things mechanically and understanding things as natural purposes. On the one hand, for Kant, the

¹⁸⁴ CJ, p.280.

¹⁸⁵ CJ, p.256.

¹⁸⁶ Eric Watkins gives a very useful overview of the key scholarly debates regarding the antinomy of judgement. For a possible solution to the antinomy, see Angela Breitenbach, "Two Views on Nature: A Solution to Kant's Antinomy of Mechanism and Teleology," *British Journal for the History of Philosophy* 16, no. 2 (May 2008): 351–69, <https://doi.org/10.1080/09608780801969167>, and Watkins, Eric and Stan, Marius, "Kant's Philosophy of Science", The

mechanical principle is to be used to judge material things,¹⁸⁷ but on the other hand, as we have seen, some objects seem to resist explanation via this method and must be thought possible through the two conditions we addressed above, thus the application of the concept of *Naturzweck* requires the use of (apparently incompatible) teleological principles. Without going too deeply into the details of the antinomy and its various interpretations¹⁸⁸ and proposed solutions, I wish to stress the characterisation in Kant's account of the use of the principle as unavoidable.

Because of all these difficulties in interpretation, Huneman has noted that “if the claim of natural purpose as a regulative principle is obscure in Kant, it was a fortiori difficult for Kant's readers to understand”.¹⁸⁹ For this reason and many others, the relation between Kant and Kiemeier, especially regarding the use of regulative principles, is highly complicated.

Kiemeier Scholarship and Regulative Principles

Lenoir bases his idea on Kant's claim that teleological reasoning – we are concerned in this debate with the status of internal teleology – cannot play a constitutive role in our understanding of the structure of an organism. It can't be considered a constitutive principle because the law “is not already given a priori”¹⁹⁰ – it isn't a determining judgement and so does not constitute objects. For Lenoir, Kiemeier's views on the nature of organic forces do not capture things in themselves, even if those views are something we suppose without claiming any necessity to the account. Since Lenoir, Kiemeier scholarship has often focused on defending this interpretation of him either as employing a regulative understanding of teleology to understand organisms¹⁹¹ or, as has been the trend more recently, scholars reject this reading and suggest that Kiemeier gives teleology a ‘constitutive’ role in the operation of organic nature.¹⁹² This discussion is complicated by different interlocutors discussing the opposition as between ‘heuristic’ or ‘regulative’ and constitutive, though the meaning of the former two terms is not at first glance quite the same – often, ‘heuristic’ is used to simply mean ‘helpful’, which can take on

Stanford Encyclopedia of Philosophy (Fall 2014 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2014/entries/kant-science/>.

¹⁸⁷ Though, as Breitenbach notes, different scholars have interpreted ‘mechanical’ differently here, I adopt the reading that Kant simply denotes efficient causality.

¹⁸⁸ Again, as Angela Breitenbach notes in her work, there is also much disagreement among Kant scholars about whether or not the principle of mechanism is considered to be a constitutive principle, on one reading the solution to the antinomy is based on the idea that the contradiction is resolved by the recognition that these principles are regulative rather than constitutive.

¹⁸⁹ Philippe Huneman, ed., *Understanding Purpose: Kant and the Philosophy of Biology*, p.15.

¹⁹⁰ Lenoir, *The Strategy of Life*, p.27.

¹⁹¹ Examples include Coleman, “Limits of the Recapitulation Theory”, pp. 341–50 and Reill, *Vitalizing Nature in the Enlightenment*.

¹⁹² This reading is promoted by e.g. Richards, Huneman, Schmitt, Bach, Gambarotto, Zammito. Critique of Lenoir's views on Kantianism in the sciences in this period is, as mentioned in the overview of scholarship, very commonplace.

rather a different sense to the Kantian description of regulative principles indicated above. Further, scholars appear to make use of different understandings of ‘constitutive’: some take it to mean something akin to an a priori feature of our judgements, whilst other scholars move away from the Kantian description in their arguments and discuss ‘constitutive’ as something like a real, inherent feature of nature itself. Gambarotto, for example, claims that “what was at stake was the determination of ‘organisation’ as the specific property of living nature and that this process implied a shift from a regulative to constitutive understanding of teleology”¹⁹³. In this picture, Kielmeyer is seen as an example illustrating that “Kant’s views on teleology constituted more of a hindrance than an aid”.¹⁹⁴ Richards, too, claims that the balance of forces Kielmeyer describes is a “constitutive” one – here understood to mean inherent in nature itself:

Kielmeyer attempted to demonstrate from inductive evidence that teleological laws operated in nature in the same manner as mechanistic laws and that such telic laws explained the balance of faculties throughout the animal kingdom. Additionally, these laws gave an account not only of the development of the embryo but also the development of species out of one another and ultimately out of the inorganic [...] Under the aegis of the forces described by such laws, nature had, he thought, constituted herself a teleologically balanced and organically connected cosmos.¹⁹⁵

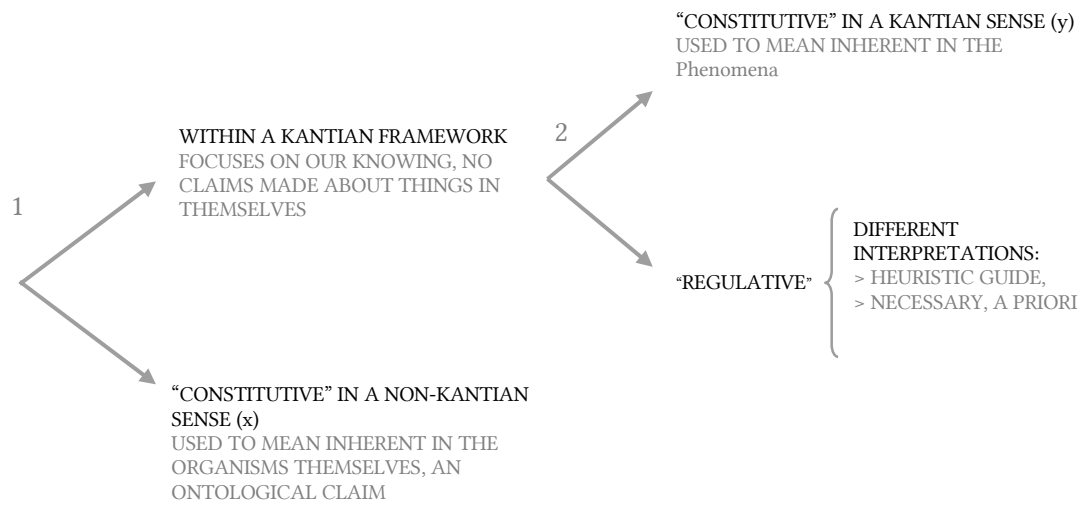
I attempt to avoid the difficulty surrounding ambiguity of terminology by clearly distinguishing (as in division 1 of fig 1., below) the more foundational division between making claims about reality or things in themselves, which often appears to be discussed as ‘constitutive’ in the literature, as opposed what I would take to be a more genuinely Kantian framework. If reciprocal means-ends relations are taken belong to the objects themselves, in such a case, an ontological claim is being made. On the other hand, if already granted that we are not talking about reality apart from our knowing, but rather, about how phenomena as they are must or should be given the nature of the knowing subject, then (dilemma 2 in the diagram) there is the question of whether these principles are used constitutively or regulatively, where constitutive is used in the Kantian sense: constitutive of *phenomena* as such. When scholars discuss whether or not Kielmeyer is using the concept of natural purposes constitutively or regulatively, they are using “constitutive” (x) as it appears in branch 1 below (not in the Kantian sense (y)) – though it is being contrasted to regulative according to branch 2:

¹⁹³ Andrea Gambarotto, “Vital Forces and Organization: Philosophy of Nature and Biology in Karl Friedrich Kielmeyer,” *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 48 (December 2014): 12–20, p.20.

¹⁹⁴ Ibid, p. 20.

¹⁹⁵ Richards, *Romantic Conception of Life*, p.241

Fig. 3. How teleological principles are used:



Accordingly, I think that Richards perhaps misidentifies Kiellmeyer’s intent as a “challenge to Kantian orthodoxy”, when he states that:

Kiellmeyer’s point was that such inductions nonetheless convinced us – and properly so – that nature was teleologically (and thus intentionally) structured; we could be convinced in this case no less than in the case of inductions of mechanistic laws governing astronomical phenomena¹⁹⁶

But this comparison of astronomical phenomena with those of animate nature – at least insofar as Kiellmeyer explicitly mentions it – is to justify an aesthetic reaction to, and thereby, an investigation into, living nature. At the beginning of the speech, he refers to the feelings we experience of nature’s greatness when considering the scale of the objects of astronomy and likens these feelings to those we can observe if we attend to the multiplicity, variety, and harmony of organisations. Even granting that Richards does not suggest here that Kiellmeyer wanted to claim that teleological laws have the same status as mechanical ones, but only that both have equal certainty, Richard’s position still leaves unexplained: a) the way Kiellmeyer couches his claims, b) Kiellmeyer’s references to the possibility of reduction, and c), Kiellmeyer’s use of the phrase ‘the great machine of the organic world’ to describe organisations, their interrelations, and forces.

¹⁹⁶ Richards, *Romantic Conception of Life*, p.241

With respect to a): the way in which Kielmeyer repeatedly couches his claims. First, in that he often stresses that his descriptions are descriptions at the level of phenomena, which makes it hard to read him as making straightforward claims about the reality of teleology as described when people talk about it, as opposed to whatever is going on in reality itself. Elsewhere, he stresses that these phenomena lend themselves to a certain viewpoint (regarding teleology), and that it makes sense to view them that way – rather than straightforwardly claiming that they are so. Supposing we didn’t want to say that there were intent to be found in the order of nature, he remarks that we would have to “admit” that in most cases this concurrence 1) “*looks like a chain of means and end to us*”, and 2) that, we find it “conducive” to “*assume*” such a chain. Discussing the interconnection of the senses in animals, “we should believe *according to our manner of speaking and representing*” that nature had “interwoven” the senses of animals together. In using this framing, Kielmeyer clearly distinguishes what “we should believe” given our faculties and way of describing and understanding things from the inherent character of nature itself.

Further clues are given in Kielmeyer’s earlier lecture notes from the decade, which outline his working conception of ‘nature’. When we study nature, Kielmeyer claims, the object of study is often not clearly defined. The term has been applied very broadly – more and more so over time. This has happened with the term ‘nature’ this has happened because the concept includes at its root the idea of emergence – the many potentials of the idea of emergence lend the term ‘nature’ to be extended to refer to a variety of interrelated ideas in common usage:

1. the *actus* that is the cause of an alteration
2. the simple historical presentation of the phenomenon
3. the kind/type denoted, and
4. the laws governing change,

Because of the proximity of cause and effect, the term can also denote:

5. the productive cause of things (*natura naturans*)
6. *and* the product (*natura naturata*)
7. physiological laws
8. laws grounded in the highest cause (physics)
9. the essence or contained properties of something
10. the sum of god’s properties

Given this proliferation of possible meanings, Kielmeyer isolates what he thinks the natural scientist proper [*Naturforscher*] denotes by ‘nature’ as follows:

“nature is everything emergent or actually appearing to our senses and which is perceived with our inner and outer sense, connected in space and time, and apt to follow certain laws.”¹⁹⁷

His choice to describe nature in this way, focusing on its phenomenal appearance rather than some of the other possible, more ontological meanings he enumerates, suggests that he doesn’t want his claims to be taken as strong ontological ones.

Regarding b), Kielmeyer’s references to the possibility of reduction in explanation: the contention is that it makes no sense to ask about how Kantian he was unless we know what he thought about the relation between these ‘organic’ forces and material nature, or nature more generally. Why? If the functioning of the organic world can be in turn explained by the same principles as the inorganic, then the use of teleology at the level of the individual is either heuristic, or a more complex notion of matter is employed. In both cases, the question as to the institution of these laws in the first place remains unanswered.

As for c), Kielmeyer’s frequent use of the phrase ‘the great machine of the organic world’ to describe organisations, their interrelations, and forces: this has puzzled commentators. What is ‘organic’ on Kielmeyer’s view? Bach claims that the reference to mechanism here is ‘clearly a metaphorical use’¹⁹⁸. But Bach’s remark assumes that Kielmeyer holds to a stark opposition between the terminology of machine and of organisation, which Kielmeyer doesn’t appear to endorse.

Moreover, the discussion of whether or not he held a constitutive (however this is understood) or a regulative view of the role of teleology can overshadow the other complexities faced in understanding what Kielmeyer means by the ‘organic world’ and ‘organisations’.

I am inclined to think that Kielmeyer was ambiguous on this issue – it certainly isn’t something he explicitly discusses, but perhaps this ambiguity was part of what lent his speech to such popularity¹⁹⁹ and uptake and development of his ideas by a range of thinkers. Perhaps Kielmeyer didn’t want to take a clear stand on this issue in his speech. In my opinion, Kielmeyer’s apparent openness doesn’t reduce to

¹⁹⁷ Karl Friedrich Kielmeyer and Fritz-Heinz Holler, *Gesammelte Schriften* (Berlin: Keiper, 1938).p.215.

¹⁹⁸ Thomas Bach, *Biologie Und Philosophie Bei C.F. Kielmeyer Und F.W.J. Schelling* (Stuttgart-Bad Cannstatt: Frommann-Holzboog, 2001).

¹⁹⁹ For evidence of Kielmeyer’s familiarity with Kant, see G Jaeger, *Ehrendächtniss Des Königl. Wurtembergischen Staatsraths von Kielmeyer*, (S.L, 1845).

the same thing as an explicit prescription of a regulative use of the concept of purpose. He could still propose these ideas in a hypothetical manner (not viewing them as true) but nonetheless reject a Kantian framework, using them instead for making predictions. But this seems unlikely, because his ‘laws’ don’t seem to be of much use in making predictions that have much determinacy (the predictions about the future of nature he discusses are addressed in the next chapter). So, if formulated for the sake of predictive power, or, as will be discussed in the following chapter, how nature ‘will be’, this would have to be viewed more as a preliminary hypothesis for further detailed research by others.²⁰⁰ In any case, for these reasons, I think that the claim that Kiellmeyer clearly proposes a constitutive use of the notion does not fit well with the evidence. I sympathise with Lenoir’s reading, but find that it is impossible to be conclusive that he couched his claims the way he did because of exclusively Kantian leanings. I find it more likely that he was deliberately ambiguous, to have a broad appeal to different philosophical camps.

To return to our opening question of the chapter, what is included under the umbrella of the ‘organic world’ thus is clear insofar as it points to certain phenomena, and describes certain features of these phenomena (forces, organised beings) but it is not clear exactly which ontological commitments, if any, are held by Kiellmeyer. He focuses on our *descriptions* and *conventions*, seemingly open that these could shift in future – which seems less strong than a regulative principle as Kant describes it, as I outlined above. But Kiellmeyer’s relation to Kant is not only of interest in order to enter into this scholarly debate, however. It is important because it provides the groundwork to draw out a particular aspect of Kiellmeyer’s views. I’d like to briefly draw attention to this aspect, which we will return to in chapter 4. The discussion so far comparing Kant’s and Kiellmeyer’s discussions of mutual determination has pointed to the similarities in their approach; indeed, Kiellmeyer’s word choice is almost identical to part of the conditions of Kant’s discussion of *Naturzweck*. Both use the same terminology of mutual or interchangeable cause and effect [*wechselseitig Ursache und Wirkung*].

However, Kiellmeyer emphasises the interrelation of these organs *in their changes at every moment*. He focuses on what he calls a *system of effects* that make up the organism, species, etc, and ultimately, the organic world in its entirety. This temporal aspect is not emphasised in the same way in the apparently similar passages in Kant’s work. In Kiellmeyer, each organ is so configured to the changes of the others that it (according to our manner of speaking) fits in simultaneous and consecutive system of changes [*in ein System von gleichzeitigen und auf einander folgenden Veränderungen so vereinigt*]. In Kant, not only the temporal emphasis, but also the presence of the two conditions outlined above for judgement of

²⁰⁰ See e.g. Jesseph on Berkeley, or Popper on Berkeley: the role of theories is to facilitate predictions. Douglas M. Jesseph, “Berkeley, God, and Explanation,” in *Early Modern Philosophy: Mind, Matter, and Metaphysics*, ed. Christia Mercer and Eileen O’Neill (Oxford; New York: Oxford University Press, 2005).

Naturzweck emphasise the simultaneity of cause and effect; this is not only in the interrelation of organs, as is also observable in Kielmeyer, but also places emphasis on role played by the *concept of the whole* organism. To quote Kant again:

the parts, through their own causality, produce one another as regards both their form and combination, and that *in this way they produce a whole whose concept (in a being possession the causality in terms of concepts that would be adequate for such a product) would, conversely, be the cause of this body according to a principle* [my emphasis].

Kant tends to discuss three levels: organ, organised being, and the entirety of organic nature. In Kielmeyer, these three levels are also addressed, but they are a few among many levels of organisation in the ‘great machine’ of the organic world. He tends to emphasise the particular interconnections of the organs, rather than the individual organism. When he discusses the individual organism, he tends to emphasise the aspect of it as an effect: “each of the individuals *animated by their organs* in this manner...”. This is not to suggest a major departure from Kant here, but more that even in his use of Kantian vocabulary and ideas, Kielmeyer’s system gives different emphases that focus less on individual organic substances.

Interestingly, Richards has suggested that perhaps the different versions of Kielmeyer’s speech are responsible for the divergent scholarly interpretations of Kielmeyer on this issue. There are two main versions of the speech available to scholars today: the originally published 1793 edition (reprinted by Kanz in 1993), and, what appears to have been more widely available before 1993, the 1938 *Gesammelte Schriften* put together by Fritz-Heinz Holler. Holler, the editor of the *Gesammelte Schriften* included an extra passage, written from the first-person perspective of “nature”, that does not appear in the 1793 publication. This passage, taken from Kielmeyer’s unpublished manuscripts, presents some points differently, as well as some points that are entirely absent from Kielmeyer’s authorised publication. The most initially striking aspect is this first-person voice – which clearly seems to be used to draw the question of intention (and so issues of teleology) into focus:

Each of the organs that I [NATURE] just said I have formed the bodies of individuals from, I have so arranged, that in connection with the rest, experienced changes in each infinitely small part of time, that the changes of one is adapted to the changes of all others...

What is notable here is that although the language of intentions is used (*I have arranged the organs so that...*), 'nature' is the 'I' here, not some agent external to it – such as a creator or contemplating individual.

But what does this difference tell us – if anything – about Kielmeyer's supposed "Kantianism"? That the 'agent' in this poetic early draft is nature itself emphasises that the (to us) apparent purposes at work are internal to nature itself. But in terms of the differences between the versions having an effect on the interpretation of Kielmeyer's proximity to Kant in particular, I see little reason to support this idea.

Summary:

Throughout the investigations of this chapter, I have tried to suggest that Kielmeyer can be intentionally ambiguous. His use of 'force', as well as his description of the purposiveness or apparent mutual determination in the organic world, are both employed with the provisos that these are 'makeshift' or 'according to our way of speaking and representing', rather than making specific ontological commitments. At the same time, I have tried to give an initial indication that Kielmeyer has a notion of organism that is not focused on an ontology of individuals that possess powers.

For the reasons discussed, to view him as straightforwardly following a Kantian research programme would also be to diminish the differences between these thinkers as well as the originality of much of Kielmeyer's work, his conjectures and bold hypotheses. The most central of these hypotheses – his use of the equilibrium concept in the context of the relations between organic forces and the effect this has on the way he conceives of species – will be the focus of the following chapter.

CHAPTER 4: SPECIES IN KIELMEYER'S NATURAL ECONOMY

The previous chapter sketched what Kielmeyer refers to when he discusses the 'organic world' – emphasising what he calls the 'makeshift' understanding of forces and organisations that make it up, as well as his reluctance to clearly endorse a specific mode of causality. Having given this initial characterisation of what Kielmeyer wanted to explain in the previous chapter allows me to address the hypothesis he proposes to explain the course and persistence of organic nature in the present chapter. More specifically, having given a clearer indication of the effect Kielmeyer wants to explain, this chapter will address the details of his use of the equilibrium concept to describe the proportional relations of organic force he posits, and the consequences of this for his account of species.

I argue that in Kielmeyer we see a shift in the understanding of species, not only from a 1) static to a historical understanding, but further, from 2) an atomic, substance-model understanding of individual species members to a less subject-centred model, and 3) interrelations rather than internal properties. Where the previous chapter addressed Kielmeyer's noncommittal attitude to the metaphysical status of these claims, here I am more interested in the details of his account of species – which can taken in various ways precisely because of this.

The idea of an equilibrium or balance among living organisms, as scholars have noted,²⁰¹ can be found in varying forms at least from Plato onwards in the European tradition. The form and elaboration that this notion takes, however, has varied greatly in various respects. I will analyse three broad aspects of this equilibrium concept: first, which components he identifies as elements of the balance; second, the manner (or mechanism) by which the balance is maintained; and third, how the history and stability of the balance was instituted and how it could change over time. This understanding will be used to draw out the issues that will bear on his species conception: focusing on the topics of history, hierarchy, and forces. Accordingly, the chapter will proceed as follows. First, in 4.1, the given the picture of the organic world developed thus far, the 'course' and 'persistence' described will be sketched, and the concept of equilibrium will be introduced in order to provide the mechanism for this explanation. I will then provide some historical context for the use of the equilibrium concept in natural economies, and explain how Kielmeyer's use is distinctive. Finally, the effects of this principle will be drawn out,

²⁰¹ See esp. Frank N. Egerton, 'Changing Concepts of the Balance of Nature,' *The Quarterly Review of Biology* 48, no. 2 (June 1973): 322–50, and Daniel Simberloff, 'The 'Balance of Nature'—Evolution of a Panchreston,' *PLoS Biology* 12, no. 10 (October 7, 2014).

focusing on the discussion of extinction in Kielmeyer's speech. In part 4.2, I will turn from the configuration of the equilibrium model in Kielmeyer to the consequences this picture of the natural world has for his species conception and the questions that arise from these considerations. I first argue that Kielmeyer's understanding of the species is temporalised insofar as they may expand or reduce their share of organic forces (although he doesn't characterise this as a species transformation), and that some species could go extinct. I use this analysis to suggest that Kielmeyer shifts the understanding of species, not only from a 1) static to a historical understanding, given his understanding of the path of nature, but further, from 2) an atomic, substance-model understanding of individual members of a species to a less subject centred model, because of his focus on forces as trans-individual categories of change, and 3) a focus on organisations as established via the activities of organic force.

Then I go on to discuss the issues of hierarchy and ontologies of force and species in Kielmeyer's account. These questions will provide the basis of my main theses about a shift in the understanding of species.

4.1 The course and persistence of organic nature

Given that the scope of his investigation is mainly restricted to 'organisations', Kielmeyer wants to explain the cause of a certain effect he notes in living nature – and, as he puts it in the original version of the Speech, 'the species which compose it' [*der sie komponierenden Gattungen*].²⁰² In announcing the main aim of his enquiry in the publication of his speech Kielmeyer states:

the greatest effect, the one which activates our attention most, must be the fact that irrespective of the many conflicting forces in it, so far as we can tell, as a whole nature always remains the same, and nature's quiet course goes on unhindered; the question of the causes and the forces by which this effect is obtained is the most pressing to us.²⁰³

There are two key aspects of this effect that Kielmeyer seeks to explain. First, organic nature 'remaining the same', and second, the 'course' of organic nature.

²⁰² GS, p.68.

²⁰³ RF, p.31.

Regarding the first aspect – I interpret the claim that nature appears to remain the same²⁰⁴ as a claim about the persistence of organised nature through change. In Kielmeyer’s view, the proliferate oppositions observable in organic nature do not lead to its wholesale annihilation. This perdurance of organic nature, which Kielmeyer describes as the “persistence” [*Bestand*] of organic nature is something that requires an explanation.

The second aspect noted here is the ‘course’ of nature. He doesn’t only want to explain the persistence, but also the course taken by the organic world in time – which suggests that the persistence noted above is not simply a static sort of maintenance. What type of path the organic world takes is hinted at a paragraph below, where Kielmeyer adds that:

This machine [of the organic world] also appears to be progressing along a path of development that we may best represent with the image of a parabola that never forms a closed circular [path].²⁰⁵

The details of this effect – regarding the consequent developmental history proposed for the organic world – will be introduced in section 4.2. For now, focus on Kielmeyer’s (less than straightforward) explanation of the cause will provide the groundwork to draw out the details of this developmental understanding of life. Kielmeyer conceives of this cause as a specific configuration of *the distribution of organic forces* – he writes that the course “of development of the organic realm is founded along with the way that different forces themselves are distributed”.²⁰⁶

The precise formulation of this cause in Kielmeyer’s speech has garnered less attention than the thematic results most often discussed in the literature. As I detailed in my scholarship review (chapter 1), much of the discussion of Kielmeyer has focused on his use (or not) of teleological reasoning, his potential introduction of the phylogenetic law, his “temporalisation” of “the great chain of being”, his role in the formation of biology as its own discipline, or whether he was an evolutionist. Because of these different focuses, most authors who address Kielmeyer summarise his results but do not go into the details of his account of proportions of force, despite the fact that this formulation bears on these issues. Kielmeyer’s formulation of this – and the concepts he employs to do so – thus deserves a more detailed examination. Despite the centrality of this issue to his thinking, it is not clear *why* this question of the distribution of organic forces (in this nebulous, speculative form) is introduced without reference to certain underlying motivations regarding constancy and change in the organic world. Scholars such as

²⁰⁴ (Besides concealing a judgement about which changes are noteworthy in nature).

²⁰⁵ RF, p.30.

²⁰⁶ RF, p.44.

Bersier and Zammito point out that Kiemeier is responsible for a “temporalisation” or “animation” of the great chain of being, on account of his compensation model of organic forces – incorporating Kiemeier into Lovejoy’s argument²⁰⁷ that a transition from a hierarchical to a temporal chain of being is a key trajectory in the history of Western thinking about the natural order. Whilst I agree with these scholars that Kiemeier introduces this important temporal element into his thinking, it should be noted that a model of understanding the organic world on the basis of the distributions of forces between different species does not of itself guarantee a particular form of dynamic worldview – it leaves undetermined the role played by the cause in the precise configuration of the effect.

Secondly, the interpretation and role of a form of ‘the great chain of being’ is also open to discussion Kiemeier. If we say that his account temporalises the great chain of being, what do we actually mean by this claim? To discern whether, and what kind of temporalisation is at stake in Kiemeier’s account requires a prior decision on what “counts” as a change and moreover what the relevant component parts of such a change would be. “Temporalising” the “great chain” might suggest that the gradations of the chain (for example, as they appear in Bonnet), appear serially in time as the scale is ‘ascended’. Kiemeier does not straightforwardly adopt the components of this chain and order them in the same way. In his speech, Kiemeier doesn’t advance a history progressing along this scale of forces from most animals with reproductive to most sensibility – though he does appear to make many remarks that suggest a progressive outlook more generally. The course of the chapter will show that the application of this concept to historical figures can obscure the complexities of their account.

The Equilibrium Concept

In the context of this 1793 speech Kiemeier uses the notion of equilibrium [*Gleichgewicht*] of force to explain how the persistence of organised nature is maintained. When ‘equilibrium’ appears in Kiemeier, it is a relatively recent term alongside the already long-established related term, *der Ausgleich*. This concept affords Kiemeier, I think, the possibility for understanding the constancy of a system – the organic world – throughout or despite internal changes to that system. Equilibrium has two key features:

²⁰⁷ Lovejoy, *The Great Chain of Being*, chapter ix, p.242-287.

in the attribution of equilibrium the system is awarded a certain latitude of change, without the system itself becoming a different one. It is in this respect a functional condition.²⁰⁸

For the most part, Kielmeyer talks about the relative proportions of “organic forces” and their distribution in different organisms. On the other hand, Kielmeyer explicitly uses the term ‘*Gleichgewicht*’ to describe an “equilibrium” or “balance” between “destructive” and “preserving” forces:

Because in the distribution of forces in the organisations, all compared, no very marked dissimilarity was produced, and the more excellent force of one was almost always offset by such an excellent force of the other, which, in case the first worked towards destruction, equally necessarily entailed preservation, then the continued existence of the organic world must have come out of this equilibrium of the destructive forces and the forces of preservation, but also the course, in so far as the mutually balancing forces are always different, and express themselves in different ways.²⁰⁹

Relative to the organism in which the force inheres, the force then is either ‘preserving’ (if in the organism itself) or ‘destroying’ (if in another organism).²¹⁰ This distinction seems then to be in turn made up of his prior, more foundational enumeration of organic forces: the approximate balance between preserving and destroying force seems to be an effect of this perhaps more foundational balance in which an ‘offsetting’ occurs.²¹¹

But Kielmeyer doesn’t only discuss balance in this manner (one which affords a latitude of change) in the context of ‘preserving’ and ‘destroying’ force. He employs the notion of or balance of organic force at several levels in his account: at the smallest scale, within an individual member of a species, and at the broadest of the scales discussed, he also investigates the titular connection in the distribution of forces between different species kinds. In these contexts the proportions under consideration in balance are expressions of the five kinds of force identified earlier: sensibility, irritability, reproduction, secretion, and propulsion.

²⁰⁸ “Gleichgewicht”, in Georg Toepfer, ed., *Historisches Wörterbuch Der Biologie : Geschichte Und Theorie Der Biologischen Grundbegriffe*, vol. 2 (Darmstadt: Wissenschaftliche Buchgesellschaft, 2011).

²⁰⁹ RF, p.43.

²¹⁰ Though this has a slightly different ideological bent.

²¹¹ Cf. Toepfer, “Gleichgewicht”.

Although notions of balance among living beings had a long history, the terminology used by Kiemeier – *Gleichgewicht* – was introduced in 1730 to translate William Derham’s use of ‘balance’ to describe the animal world in his *Physico Theology* (1713). Derham wrote that:

The Balance of the Animal World is, throughout all Ages, kept even, and by a curious Harmony and just Proportion between the increase of all Animals, and the length of their Lives, the World is through all Ages well, but not over-stored.²¹²

However, Derham proposed the idea of an equilibrium among living creatures in a theological context, to describe the harmony of nature. In his account, various natural phenomena (e.g. differing rates of reproduction among different species with different longevities standing in different predation relations to each other) are understood to be part of God’s plan to preserve this balance.²¹³ Jozef Keulartz notes that “in physico-theology the ‘struggle for life’ is portrayed as an integral and essential element of natural harmony”²¹⁴ – in other words, the conflict created by every animal aiming at survival is productive of a (relatively static) “harmony” because of the population dynamics of species – governed by their longevity, predation rates, and reproductive rates. That no kind is considered ‘overstored’ by Derham also suggests a judgement about a ‘correct’ number of individuals for each kind as that which maintains a certain order of things, an order of things in which every species is kept more or less constant in its numbers of individuals.

Whilst in Kiemeier we see this terminology of equilibrium in the organic world taken up, the broader theological context is notably absent, at least in his lecture *On the relations of Organic Forces*. There, he discusses the functioning of an organic system, (the *course and persistence* mentioned earlier) but not the *institution* of this functioning. Although he begins his speech with an infuriatingly enigmatic discussion of nature appearing ‘as-if’ directed at a goal,²¹⁵ in the published version of the speech he leaves open the question of intent in the apparent means-end arrangement of the natural world and its objects. This has the consequence that he is able to entertain more significant changes within his system of organic nature: changes at the level of force in Kiemeier can affect not only the numbers of individuals in a species, but further, the number of species themselves, without a disruption of the equilibrium of force. The reason for this increased flexibility is that the ‘balance’ or ‘equilibrium’ that *grounds* the relative numbers of organic beings, and consequently, their kinds, is in turn grounded here in proportions of

²¹² Derham quoted in Frank N. Egerton, ‘Changing Concepts of the Balance of Nature,’ *The Quarterly Review of Biology* 48, no. 2 (June 1973): 322–50, <https://doi.org/10.1086/407594>.

²¹³ See e.g. Egerton, ‘Changing Concepts of the Balance of Nature’ p.333.

²¹⁴ From Jozef Keulartz, *Struggle for Nature* (London: Routledge, 1998) p.26.

²¹⁵ This discussion appears with different emphases in the manuscript reprint from the *Gestammelte Schriften*, (where nature is given a voice in the first person) to Kiemeier’s own 1793 publication.

forces rather than relative numbers of *individual members* in a species being maintained, as it was in (for example) Derham's model.²¹⁶ There are more ways that the expression of force can vary, and many more combinations of these expressions in Kiemeier. Its distribution is highly flexible. The dynamism of his system is such that Kiemeier's 'harmony' is not a stable harmony: his equilibrium can have radically different distribution of proportions of force at different times. But what does it actually mean to say that Kiemeier applies the equilibrium concept to "forces"?

The Economy of Extinction

First, the clearest result of his postulation of a balance among forces rather than species populations is that it allows him to posit a constancy of organic force despite (what we might consider quite extreme) phenomenal changes. The most obvious instance of this is Kiemeier's discussion of species extinction, which Kiemeier's conceptual apparatus allows him to frame as consummate with both the 'course and persistence' of the organic world. The configuration is such that he considers the system as a whole – regarding the quantity of force that appears in the expressions of organic phenomena – not majorly disrupted by even these sorts of changes. However, this reading of Kiemeier is not without detractors, as I will discuss in this section, William Coleman held the view that Kiemeier wouldn't have accepted the idea of species extinction. To draw out the mechanics of Kiemeier's model of the organic world, then, involves discussion of this possibility.

Kiemeier appears to explicitly discuss species extinction [*Zerstörung*] in the published version of the 1793 speech, writing that:

many species of mussels [...] by scant compensation in their forces, and by the wealth of forces nature gave higher animals for their destruction, are placed on such a dangerous peak that one can assume with likelihood that the decline of one or other species is gradually occurring, and has perhaps already often happened [...] what so many higher animals are capable of when it comes to some mussel species, humanity and its species are capable of doing with respect to so many other, and also higher, animals.

Admittedly, like most of Kiemeier's ideas, this is presented as a probable inference rather than a definite deduction. It could be argued that by a 'decline' of species, no extinction is implied: perhaps a species' location on a 'dangerous peak' signifies that Kiemeier subscribes to an equilibrium regarding

²¹⁶ Rather than approximate *numbers* of species members, the unit of analysis kept stable is total amount of force.

species members in which no species is ever eradicated, though the relative numbers of one kind may increase or decrease dramatically as the inverse happens in another, so long as in this oscillation, no kind ever reaches zero. Though, if this were meant, I think it would become unclear what would be “dangerous” about this “peak” if the destruction of a kind were not a real possibility.

These possible arguments that Kiemeier would not countenance the idea of extinction are rendered unconvincing, because Kiemeier adds that the kind of events mentioned above will likely happen frequently in the future as the result of human action:

Humanity also actually displaced other species of animals, transferred them to small areas as strangers while it took the rest of the earth into its possession, indeed it enslaved entire species, and it is more than merely probable that it will compel still many more to completely exit the stage in order to make space for itself, as one organ replacing another in the great machine.

The compulsion to ‘completely exit the stage’ as humans expand their forces, as well as the image of organ replacement, seem to suggest extinction of one type with another species occupying or taking over its quantity of force. However, discussing a letter Kiemeier wrote to Windischmann at a later date (1804), William Coleman writes that:

To Kiemeier extinction would introduce real, not just apparent, multiplicity into organic creation. This hypothesis violated the fundamental, idealized continuity of creation and was therefore to be rejected.²¹⁷

It does seem to be the case that by 1804, Kiemeier seriously questioned the possibility of species extinction, although without ruling it out categorically, finding Lamarck’s explanation of transformation “more likely”²¹⁸. In 1804, as Coleman points out, Kiemeier suggests²¹⁹ that what could be interpreted as evidence of extinctions (e.g. bones of animals which match no existing varieties) is “also interpretable as changed *orientation in the formative force*, that entered with the changes of our earth” – so, as evidence of changes within species in line with the earth’s changing geological conditions. If we were to accept Coleman’s view, we would have to explore further the kinds of ‘changed orientation in the formative force’ Kiemeier refers to. Regarding this change, in a footnote referencing Lovejoy’s great chain,

²¹⁷ Coleman ‘Limits of The Recapitulation Theory’, p.348.

²¹⁸ Coleman ‘Limits of The Recapitulation Theory’, p.348.

²¹⁹ The issue under discussion in the letter is: what kind of changes are to be considered likely in organic nature, given that Kiemeier does not doubt a causal link between the earth’s geological conditions and organic beings. Kiemeier says the possibility is faint of 1) a ‘sinking back’ from a ‘better’ to a ‘worse’ form, (as he thinks Schelling holds) 2) the arrival of aliens from another world or 3) a product of our earth when it was in a different relation to the other heavenly bodies 4) and it is faint that the certainty that not all changes on the earth are developmental.

Coleman²²⁰ chooses to contextualise Kiemeier's remarks in relation to Herder²²¹, such that 1) no extinctions are granted, and 2) subscribing to progression in species does not imply transformation to a new kind but rather a development to a new stage *internal* to the species.²²² We might think of this as a geological change precipitating the manifestation of a different set of potentials already possessed by a species activated by new geological circumstances (i.e. all these forms are already contained within the egg and the development of that egg into an animal of a particular shape is contingent on its geographical circumstances), or instead, as a gradual transformation effected alongside the change of the earth where the species has an internal history that progresses alongside the earth's history. For the moment I will put to one side another issue raised by point 2 above, that of whether change is considered to be internal development or transformation to a new form in particular cases.

Focusing on the challenge made to the idea that Kiemeier believed in extinction events, first it should be of course pointed out that, although he often talks as if what he said applied to Kiemeier's work in general, Coleman is here dealing with a later letter of Kiemeier's. So even if we were to accept Coleman's view regarding extinction in 1804, it doesn't mean it was ruled out in 1793. But I think there are good reasons to think that it was held in 1793, and not merely accommodated, but something Kiemeier intended his theory to explain – at least in 1793. To show that this is the case, I think, involves proving that these phenomena are not explicable via a transformation within species, in which

²²⁰ Coleman also uses this line of reasoning to argue that "Kiemeier's remarks on transmutation imply necessarily neither a coherent conception of large-scale evolutionary change nor a plausible causal mechanism", citing Heinz Stolpe, "Herder und die Ansätze einer natur-geschichtlichen Entwicklungslehre im 18. Jahrhundert," *Neue Beiträge zur Literatur der Aufklärung*, ed. Werner Krauss (Berlin: Ritter & Loenig, 1964), pp. 289-316, 454-468. Lovejoy's account of the principle of continuity is that there are no gaps in nature; every kind borders on something else in the continuum. (Lovejoy's main account follows what he describes as the fusion of this principle of continuity with that of plenitude (whatever potentially exists must actually exist, i.e. there are no unrealised potentials that are genuine potentials) in intellectual history. As an aside, either at the earlier or later time in Kiemeier's thinking, I see little reason to support Coleman's idea that he reasoned from an *a priori* subscription to the principle of continuity to facts about the empirical world (in our case, the impossibility of extinction), but also to argue for development as opposed to evolution. In fact, it seems that rather than reasoning from a qualitative principle, Kiemeier progresses from the idea of a certain quantity of organic force that can be deployed in radically varied ways – giving rise to a much broader, more flexible notion of organic nature. In an 'organisation' of the kind Kiemeier describes the organic world to be; when a species is annihilated, it's replaced by a new organ, or a new cog in the 'great machine': The machine doesn't break down.

²²¹ In *Ideen*, Herder claims that there haven't been any extinctions in the current age. However, he doesn't rule it out for other ages: "noch ist also bei der gegenwaertige Beschaffenheit unsrer Erde, keine Gattung ausgegangen; ob ich gleich nicht zweifle, dass da diese anders war, auch andre Thiergattungen haben seyn koennen [...]" in *Herder's Werke*, part 9, *Ideen zur Philosophie der Geschichte der Menschheit*, (Gustav Hempel, Berlin, 1867), p.90.

²²² Coleman seems to claim that Kiemeier subscribed to the principle of continuity, but not plenitude, because of the changing "great flux" of nature; likewise, he treats Kiemeier as if manifesting the stereotype of a *Naturphilosoph*: deducing ideas about phenomena from an *a priori* principle. He thus writes that: "All creatures are therefore active entities, responding ceaselessly to the stimuli of external and internal stresses. As a consequence the developmental force could produce a truly complete, perfectly graduated scale of beings only in that case where ambient conditions are unchanging. In the great flux which is nature, however, these ideal conditions are nonexistent. The threefold parallelism of nature was thus, again, an idealized representation of the perceived diversity of past and present worlds. Kiemeier's views coincide with those of Lamarck regarding the consequences of the adaptive power of the organism. Both realized that the quest for a perfect gradation in nature of minerals, plants, and animals was chimerical (organisms were plastic beings which, because of their nature, bend to circumstance), while both authors also thereby preserved the rich fullness of the creation": Coleman, "Limits of the Recapitulation Theory' p.341-50.

case, the number of kinds in the organic world would remain constant as no lineages would be able to have died out. If we look again at the quotation from above: “[humanity] will compel still many more [species] to completely exit the stage in order to make space for itself, as one organ replacing another in the great machine”,²²³ the compulsion to ‘completely exit the stage’ as humans expand their forces, as well as the image of organ replacement, seem to suggest extinction of one type with another species occupying or taking over its share of forces. This redistribution of force can also be seen in his discussion of the change in distribution of forces made consciously by humans. Kielmeyer writes that:

With the rationality that turned up in humanity’s organisation, mankind obtained the capacity to freely alter (within certain limits) the ratio [*Verhältnis*] of the other forces that it has in common with the other animals. It created microscopes and telescopes for eye and ear, and thereby heightened its sensorial capacity, and who knows whether further similar improvements may not be applied to smell and touch.²²⁴

The tools used by humans form extensions of their organs made possible by their use of reasoning. Insofar as it is used to further a sensorial capacity, a microscope becomes part of the human organisation. The key issue of import in these passages for our purposes is that taken together, they suggest not just a simultaneous parallel rearrangement of forces in two species, e.g. humans increasing their sensory powers (and therefore having a different internal ratio of forces) whilst e.g. muscles increase their reproductive power. Rather, the key point is that something is being lost from one species and taken up in another – Kielmeyer writes that:

To increase its capability of movement, it coerced other animals, fire, and wind, to lend theirs to it, and through these changes that it undertakes in the proportions [*Verhältnisse*] of its forces, and through its greater capability to endure each of these changes, it obtained with its species a decisive preponderance over most other animal species and their forces of preservation.²²⁵

The ‘coercion’ of other entities to ‘lend’ capabilities to humans – taken in combination with his earlier discussion of species of mussels, to me suggests that this should be considered as a redistribution of forces between kinds, rather than as a distribution internal to two kinds (which could be understood with Coleman’s Herder-influenced model). Because of this, species kinds or individuals would not have to be thought constant in Kielmeyer’s schema. His remarks likely therefore imply genuine species extinction. Regarding the issue of changes countenanced in his system- for humans to alter not only

²²³ RF, p.44.

²²⁴ RF, p.44.

²²⁵ RF, p.44.

their own proportions of force, but also their share of total force, even to wipe out other species (even if this is due to the use of technology) is part of the ‘life’ of the world.

4.2 Consequences for Kielmeyer’s conception of species

History

In this section, I argue that Kielmeyer’s understanding of species is temporalised insofar as they may expand or reduce their share of organic forces (which he does not characterise as a transformation in species), and that some species could go extinct.

What scholars have called Kielmeyer’s compensation model – the idea that an offset of a lack in one respect within a species with a plenitude of another – could be easily made sense of in a scenario where no species could be truly extinguished. In such a model, the ‘compensation’ would explain, via the possession of functions, or number of individuals, etc, why each species could persist and (more or less) maintain its numbers. However, it is difficult to see why or how this kind of argument can be combined with his remarks about species extinction. Compensation seems to help with describing a relatively stable system, or a snapshot of the organic world at a particular moment in time, where it could make sense of how the forces are relatively distributed. But the organic world according to Kielmeyer’s description follows a linear progression, as a “parabola that never closes in on itself”²²⁶.

Further, I think we *can* reasonably conclude that Kielmeyer thinks extinction events either have happened or will happen at some point, and moreover, an extinction as a genuine eradication of a kind, rather than a gradual development of the kind (though I think he also holds that this happens). And it seems that in his discussion of human activity – using instruments – we have a case where a larger ‘share’ of the forces available are concentrated in one kind. But because he has given an account of this, without any account of how new species could arise, or of branching of existing species into distinct ones, the path of his organic world could potentially be read as a progressive reduction of species kinds, with each kind remaining holding a greater concentration of force.

²²⁶ RF, p.30.

But to say whether or not this is what Kielmeyer had in mind, or whether it is really an unintended consequence of his remarks, is very difficult given the multitude of unanswered questions about his account. Most importantly in this respect, he does not present an account of how novelty or species transformation could arise if this narrowing picture were to be avoided.

One of the reasons for the difficulty in constructing an account of species transformation or metamorphoses from the resources in Kielmeyer's speech is down to his reticence to discuss there what is outside of the equilibrium of organic forces and how it relates and relates to the share of those forces. The speech only really gives animal examples, even though it purports to describe the course of the entire organic world. It is easy to imagine how vegetal life is composed from different proportions of the same forces as the animal, but it difficult to draw conclusions about how he thought these 'organic' forces interact with or are composed out of the inorganic – e.g. chemical forces – though Kielmeyer speculates that we may be able to reduce our understanding of the organic to chemical or lower forces. So it's difficult to say much about the course of the organic world insofar as it responds to, for example, geological changes, and more generally, the relation of the 'organic' forces to the other levels of nature and how they interact causally. Kielmeyer countenances the possibility that other force can be coerced into additional organic power (e.g. 'fire', 'wind'), but this will have the effect of a reduction of organic forces elsewhere or in other species:

To increase its capability of movement, [43] it coerced other animals, fire, and wind, to lend theirs to it, and through these changes that it undertakes in the relations of its forces, and through its greater capability to endure each of these changes, it obtained with its species a decisive preponderance.

That Kielmeyer claims that the organic world has a developmental history still leaves the specific details about what this could involve absent. Species extinctions certainly seem to be a feature of this development, and are a consequence of the relative distribution of forces in different kinds. As I've speculated, it seems as though the result of Kielmeyer's initial distribution of forces between different species leads to a progressive narrowing of the distribution of forces between kinds, such that there are fewer kinds extant as time progresses, but that these extant species have at their disposal a greater share of organic force.

Kielmeyer uses the image of the parabola to sketch the form of his historical understanding of nature's development. It seems redundant for him to state that such a parabola “never forms a closed circular

path”, but we can at least reject the possibility that he held to a cyclical understanding of history in the vein of Mendelssohn:²²⁷ the development of the organic world presented in the *Rede* is clearly linear. Otherwise, a parabola (a symmetrical conic section) is not the most informative image for his understanding of the process – what kind of linear progression does he mean? At least the x-axis seems likely to represent temporal development, but the change in the y-axis regarding what value is being increased (or decreased, depending on the orientation of the parabola) is unclear. I can see two broad potential interpretations – either (i) not much should be made of the symmetry or the parabolic shape itself, but one significant feature is that the line of the parabola is continuous, and open-ended, suggesting an unending development of the organic world. A differing possible interpretation (ii) is that the shape of the parabola could represent an emergence, and then a (symmetrical) fading after a peak in organic development – according to this, the y-axis would denote quantity of organic force in the world at different times in its development. The second interpretation does not mesh well if the account I’ve given of the role of the constancy of total amount of force over time is correct, because it suggests a quantitative change in this value. As there is no other evidence in the speech that would support that second interpretation – i.e., that the organic world emerges (and then fades), then at this time at least (the early 1790s), we can assume that he is not proposing this.

In his lecture notes from 1790, Kiemeyer gives his own definition of natural history. Here, he again emphasises the diachronic character of a genuine description in ‘*natural history*’:

the history of the phenomena yielded by our earth as a whole, must according to the concept of natural history, address not only the question of their present state, but also that of the states preceding and perhaps succeeding the present one – thus, how it is, how it *was*, and how it *will be*.²²⁸

This earlier account of natural history as requiring investigation not only into the present, but also the past, and perhaps future, appears consonant with what Kiemeyer will later describe as the ‘path’ of the organic world. However, in the 1793 description – if it is to be considered *Naturgeschichte* – Kiemeyer’s account does not dwell on the establishment of that world at length beyond the claim that the path of organic nature is established along with the proportions at which the forces are initially distributed.²²⁹

²²⁷ See Erlin, “Reluctant Modernism: Moses Mendelssohn’s Philosophy of History,” *Journal of the History of Ideas* 63, no. 1 (January 2002): p. 83.

²²⁸ Kiemeyer, ‘On Natural History’, Trans. Iain Hamilton Grant, in *Kiemeyer and the Organic World*, (Bloomsbury, 2020) p.60. From ‘*Über Naturgeschichte*’, (p.228) pp. 211-234 in *Kiemeyer’s Gesammelte Schriften*, Bebenhausen, April 21-23, 1790.

²²⁹ Here again Kiemeyer suggests a dialectic internal to organic nature that appears independent of whatever might be outside of this sphere.

On the one hand, with the image of the parabola, and a continual path of development, Kiemeier's organic nature (and the consequent fate of species), combined with his lack (as I have outlined in the previous chapter) of clear commitment to mechanism or teleological understandings of causation, and open questions about the possibility of transformations and of the potential role of what is considered external to organic forces, can be seen as open ended. But at the same time, the possibility of extinctions is granted by means of the rearrangement of forces. The possibility of rearrangement, as Kiemeier gives in his only example (the human being), seems to be down to the capacities originally present in the human species, so this could be seen ultimately as part of a dialectic internal to the organic world.

Whilst, as I mentioned in the scholarship review, while the topic of evolution is often a focus in studies of the period, here other changes, such as extinction, seem to be more of a concern. In addition, Kiemeier will later signal that he remains open to the possibility that so called 'degenerations' have occurred.²³⁰

Speciation

I have suggested that the consideration of individuals and species as atomic units in population dynamics, which had formed the basis of Derham's view, is not the central basis of the balance of nature proposed by Kiemeier. Where previous natural economies sought to explain the maintenance of relative constancy in the natural world, Kiemeier wants to explain the *path* of that world: how it was, is, and will be. That he doesn't hold this view is the result of his emphasis on equilibrium of forces rather than of individuals or even of species in his discussion. But although the emphasis of the equilibrium in his account is at the level of forces, species seem to play a role as causal factors beyond the activities of the individuals which make them up. Putting aside for the moment the question of whether the individual, force, or both are to be considered the true *causal* agents, the related question remains whether a proportion of force would be by itself enough to articulate a species, or an individual species member: what role do proportions of forces play in speciation and individuation?

Is speciation just a question of proportions of forces? Certainly his indications that the course and persistence of the species that make up the organic world are grounded in proportions of force suggests this may be the case. But it is far from clear what species are metaphysically speaking, for Kiemeier.

²³⁰ "Zurücksinken aus der bessern Form", a possibility that Kiemeier attributes to Schelling. See Kiemeier, 'Letter to Windischmann', 1804, (GS, p. 203).

Against the idea that species is reducible to a proportion of organic force: because it is likely that Kielmeyer held (at least in the 1790s) that species could change their share of forces over time, it seems unlikely that the particular ratio of forces in each individual of the species would entirely characterise the species (like a fixed essence, for example). Such a change in the share of forces would have to inevitably alter the proportions with the species. Equally, there would have to be some further way to account for variation between individuals within a species, for example, different gender forms or different forms of individuals aligned to different roles (e.g. worker, drone, and queen bees), so if a particular ratio of forces were characteristic of species on his account, then either that ratio could not determine every aspect of the individuals – either because it leaves some things undetermined, or because it is inhibited in some way.²³¹

If it were the case for Kielmeyer that speciation is merely due to the individual's resulting from certain proportions of force (to express a certain ratio of organic forces in that case would form the criterion of species membership), then his speech could be viewed as a move away from a subject-oriented ontology insofar as individuals would be the consequent expressions of groups of forces, a manner of conceptualising the natural world and its changes where the individual is an effect, rather than cause. As Iain Grant points out, "The basal element, in other words, consists in nothing other than the proportions of forces whose *phenomena* are determined structures, populating animal, mineral and noetic worlds with all kinds of bodies."²³² This could mean either that forces would form the more foundational reality, or, that the individual, having emerged from proportions of force, then would become a cause (post-emergence).

What is the relation between the forces posited and the natural entities in which they unite: is an individual the product of a combination of forces, or are the forces something which the individual has as the bearer of them?²³³ As I outlined earlier, Kielmeyer's account of an organisation is that it is a certain kind of structure that results from the *activities* of organic forces. On the one hand, a certain proportion of forces seems to be constitutive of and necessary for the existence of an organisations. This would be to provoke the question: is being an individual member of a species equivalent to being an organisation? Earlier I suggested that Kielmeyer gives a dynamics of organic forces that does not make much reference to anything external to it. But because Kielmeyer could be seen as offering here an organic level of account, that doesn't necessarily mean that when it comes to considering every aspect of

²³¹ Another possible move is to redefine a genuine (rather than apparent) species individual as the amalgamation of these different roles (as e.g. Schelling will claim at times in the first outline about gender), where what we might normally consider several individuals actually make up one individual when considered ontologically.

²³² Grant, *Philosophies of Nature after Schelling*, p. 137.

²³³ The proportions of force can't be completely divorced from the organism's form. For example, we are given the indication that factors such as the mass of the animal body and the complexity of its build are accounted for by the amount of reproductive force present.

individuals that he would not use other modes of explanation; it is just that his focus is organic forces, so he does not address these other possibilities. In any case, it seems that to think about organisations, for Kiemeier, is to think about activities which are their effects, and the relationship between species and organisations focuses on organic processes rather than features of animals or their morphology apart from those effects.²³⁴

On the other hand, in the compensation model Kiemeier describes, the same quantity of force can be expressed in qualitatively different ways. It is not clear what would drive either the species' characteristic proportions of force or the individual organism to express a proportion this way rather than that, without recourse to some other explanation of the animal's form. So neither the species, nor the individual can be reducible to a proportion of organic force – this is certainly not enough to individuate either on Kiemeier's model. If individuation or speciation are not down to proportions of force alone, then another explanation of these issues is required to answer how form is developed, and what is responsible for it. Again Kiemeier's lack of explanation with regard to the relation between organic forces and other forces in nature has become relevant.

Kiemeier's claims therefore indicate a shift in the understanding of species, not only from a 1) static to a historical understanding, given his understanding of the path of nature, but further, from 2) an atomic, substance-model understanding of individual members of a species to a less subject centred model, because of his focus on forces as *trans-individual categories* of change. Species must bear some relation to such trans-individual forces, but they cannot be reduced to a proportion of forces held in common by members of the species, because the proportion of forces held by a species can change. We must either accept that species is therefore not a proportion of forces, as the most intuitively plausible reading of Kiemeier might suggest, and then try to work out what Kiemeier's positive account of species is, or suggest that there are some inconsistencies in Kiemeier's account, but that nevertheless he held species to be composed of proportions of force that interact dynamically with other species. But although I do not believe Kiemeier was especially concerned with the metaphysical implications of his views on species, his account is not inconsistent because he ultimately does not directly identify species membership with having a particular proportion of forces.

Nevertheless, nothing in Kiemeier's discussion suggests that when humans use telescopes he thinks they become a new species – even though these telescopes are incorporated into the organism in

²³⁴ An alternative possibility is that a species just is proportions of force (so any individual instantiating that proportion of forces is a member of the species), but an individual organism isn't only such a proportion, because organisms of one species are not all identical. Variation within species could accordingly be explained by whatever it is about an individual that deviates from or goes beyond the proportion of force it instantiates as a member of that species.

question.²³⁵ This does suggest that a change in share of forces possessed by an individual (and in turn the species) does not change species of itself, and as such that there is something else that constitutes species here. Accordingly, if Kielmeyer's account of species is not the result of his account of force alone, it would make sense to ask if his account of species is coherent with his account of proportions of force. I have tried to suggest that Kielmeyer claims that the persistence of and changes in the organic world can be explained by proportions of force. And I have accordingly claimed (and continue to explain in the following chapter) that Kielmeyer thinks that the proportions of force in the world can shift, and that this can lead to declines of species, that are also surely alterations in proportion of force. But it is still textually underdetermined, I think, what exactly Kielmeyer thinks species are. This is especially evident when the earlier manuscript (from the *Gesammelte Schriften*) containing references to 'species' where the later publication says 'organisations', Kielmeyer indicates that he may also have been aware of some of the problems with the claim that a species is straightforwardly equivalent to a particular proportion of force. I suggest that, as in the case of individual organism, species too are a kind of shorthand for picking out certain proportions of force according to criteria other than the proportions of force in question. It is still possible to use our ordinary, everyday notions of what species are, for example – even when the proportions of force have changed. Just as it is still useful to speak of particular individual organisms rather than various forces even though the latter is a better unit of analysis for Kielmeyer's theories, so too it is useful to use species terms to pick out other proportions of force. Likewise, the reciprocal relationships between individuals and species are in fact relations between proportions of forces – but are more conveniently spoken about as reciprocal relations between species and individuals.

Whilst Kielmeyer holds back from too strong a metaphysical account of what species really are, my view is that this ambivalence (together with the details of the relations between proportions of forces in various instances) makes his account productive and give rise to questions others could take up. In particular, what is most important is that Kielmeyer's 'makeshift' view of forces, whatever their precise metaphysical status, allows for an expansion of the sense of organic reciprocity found in Kant to the relation between the individuals and species.

²³⁵ I do not think that we must go as far as treating species themselves as the bearers of the forces and able to bear changing shares of those forces

In *On the World Soul*,²³⁷ Schelling enthused that Kiemeyer has set a new standard in the discipline of natural history, praising him for the project of forming a ‘graded series’ [Stufenfolge]²³⁸ of living beings [lebenden Wesen] according to the functions they possess. Regarding this graded series, Schelling remarks that he and Kiemeyer have reached the same findings, but by different methods: Kiemeyer empirically, and Schelling via the deductive method of *Naturphilosophie*, such that:

the earlier consequence is now undeniable, in living being a graded series of functions occurs, because nature opposed to the animal process irritability, to irritability sensibility, and in that way staged an antagonism of forces, which mutually maintains an equilibrium in which as one increases, the other falls, and conversely [...].²³⁹

Because he established this graded series of living beings, Schelling praises Kiemeyer for ushering in a ‘completely new epoch of natural history’²⁴⁰ in *On the World Soul*. But in the *First Outline*, Schelling credits Blumenbach and Herder with Kiemeyer’s main ideas, which he describes in terms of a ‘comparative physiological series’ wherein sensibility and irritability are displaced by reproduction:

The idea of a comparative physiology is already found in Blumenbach’s *Specimen physiologiae comparatae inter animalia calidi et frigidi sanguinis*, and further explicated in the discourse on the relations of the organic forces by Mr. Kiemeyer, whose major idea is taken from Herder’s *Ideas for the Philosophy of the History of Humanity*, first part, pp. 117–126; namely, that in the series of

²³⁷ “Da es nun dem Bisherigen zufolge unleugbar ist, daß im lebenden Wesen eine Stufenfolge der Funktionen statthat, da die Natur dem animalischen Prozeß die Irritabilität, der Irritabilität die Sensibilität entgegenstellte, und so einen Antagonismus der Kräfte veranstaltete, die sich wechselseitig das Gleichgewicht halten, indem, wie die eine steigt, die andere fällt, und umgekehrt, so wird man auf den Gedanken geleitet, daß alle diese Funktionen nur Zweige einer und derselben Kraft seien, und daß etwa das Eine Naturprinzip, das wir als Ursache des Lebens annehmen müssen, in ihnen nur als in seinen einzelnen Erscheinungen hervortrete, ebenso wie ohne Zweifel ein und dasselbe allgemeinverbreitete Prinzip im Licht, in der Elektrizität usw. nur als in verschiedenen Erscheinungen sich offenbart.“ FWJ Schelling, *Von Der Weltseele. Eine Hypothese Der Hohem Physik Zur Erklärung Des Allgemeinen Organismus* (Hamburg, 1806). Part VI.

²³⁸ Peterson translates as ‘graduated series of stages’: FWJ Schelling, *First Outline of a System of the Philosophy of Nature* [FO], trans. Keith R Peterson (Albany: State University Of New York Press, 2004).

²³⁹ FWJ Schelling, *Von Der Weltseele*. Part VI.

²⁴⁰ “Anmerk. Da große Naturforscher zu demselben Resultat auf anderem Wege gelangt sind, so kann man zu dieser Idee um so kecker Zutrauen fassen. Besonders bestätigt sie sich durch Betrachtung der fortschreitenden Entwicklung der organischen Kräfte in der Reihe der Organisationen, worüber ich den Leser auf die schon im Jahr 1793 erschienene Rede des Hrn. Professor Kiemeyer über diesen Gegenstand verweise, eine Rede, von welcher an das künftige Zeitalter ohne Zweifel die Epoche einer ganz neuen Naturgeschichte rechnen wird.“ FWJ Schelling, *Von Der Weltseele*, 323.

organisms, sensibility is displaced by irritability, and as Blumenbach and Sömmering have proven, by the force of reproduction.²⁴¹

Whilst both the earlier and the later comments emphasise a series of functions (or sensibility, irritability, and reproduction), the earlier quotation explicitly addresses Kiemeier's introduction of an equilibrium model for understanding the proportions of these forces. In contrast, the later quote especially singles out the comparative physiology of displacement as Kiemeier's 'major idea'. This later choice suggests a somewhat limited picture of Kiemeier's project and its implications on Schelling's part. Of course, there could be many reasons for Schelling's change in attitude from viewing Kiemeier as the instigator of "an entirely new epoch of natural history" to someone who basically repeated ideas already found in Herder and Blumenbach. But that this deflated attitude is coupled with what seems to be a narrowing view of Kiemeier's project could be symptomatic of a more profound difference between Kiemeier's thoughts and those of Schelling.

. The ontology underlying Schelling's account of the 'comparative physiological series' will be explained further in chapter 5. For my purposes now, we will use Schelling's cooling attitude – and moreover, his later choice to emphasise the 'comparative physiological series' as Kiemeier's most important idea – to draw out aspects of Kiemeier's thought.

In Schelling's own account he raises criticisms of Kiemeier. He claims that whilst Kiemeier and others had pointed out certain relations between the proportions of force in different organic groupings, how this works (the mechanism) and the cause (ground) was yet to be explained.²⁴² Schelling complains of Kiemeier (as well as Herder and Blumenbach) in a note that it had not yet been shown "how sensibility is supplanted by irritability, and both finally by the preponderance of reproductive force"²⁴³ – a task Schelling took himself to have completed in FO.²⁴⁴ But Schelling's remarks about Kiemeier are for several reasons not entirely fair. What I mean by this is that, first, even if Schelling's claims about the lack of discussion of mechanism or ground are accepted, it misses the emphasis of Kiemeier's discussion: the graded or comparative series does not itself appear as something we need to focus on investigating the foundation of. Rather, this series is posited in order to be able to explain something

²⁴¹ FO, p.141.

²⁴² He claims that "neither the mechanism nor ground of this graduated series has been discovered up to now" FO, p.141.

²⁴³ "But HOW sensibility is supplanted by irritability, and both finally by the preponderance of reproductive force, has not been explained at all by any of these investigations. (Note appended to the original note now continues. –Trans.) Neither the mechanism nor the ground of this graduated series has been discovered up to now. This has in part already come to pass in our deduction and will proceed from this point." FO, p.141n.

²⁴⁴ "This has in part already come to pass in our deduction and will proceed from this point." FO, p.141n.

else, namely, the ‘course and persistence’ of the organic world, and, in one version of the speech, of the species that make it up.²⁴⁵

Further, regarding the ‘mechanism’: whilst Schelling is right that Kiemeier doesn’t give precise or detailed accounts of how the series works – nor does he intend to, since his speech is an incredibly brief sketch²⁴⁶ – it doesn’t seem to be the case that Kiemeier gives no indication of how the ‘displacement’ functions. If what suffices for a ‘cause’ can only be showing how we can organise what we experience in terms of a deduction from first principles, as Schelling attempts in his *First Outline*, then it is fair to say that we don’t get this kind of cause in Kiemeier’s account. However, Kiemeier’s description of the ‘course’ of the organic world requires he provide some suggestions that indicate certain commitments – albeit hesitant and provisional – in this regard. If we fill out this picture, we can see that the structure of the series in Kiemeier and Schelling is more dissimilar than might appear at first.

What kind of series is posited in Kiemeier’s speech? It is certainly hierarchical insofar as entities are classed as above or below each other in a series: Kiemeier continually refers to “lower” and “higher” or “more perfect” species in a series (“*Reihe*”, “*Stufenfolge*”) of organisations. At first glance, it seems that the animals with the greatest proportion of sensibility would be the highest, and with the greatest proportion of reproduction the lowest, with irritability being the middle between these two – it does certainly seem like Kiemeier privileges sensibility in some way above these other kinds of force described. But does Kiemeier really subscribe to the hierarchical aspect, or rather, use the language available to him to advance something a little different? The principle underlying this apparent hierarchy – and how linear it really is – are far from transparent. Certainly, it seems more complicated than the line Schelling attributes to him: that which arranges species in a linear series according to their possession of functions from reproduction, at the lowest, to irritability, to sensibility at the highest. For a start, Schelling’s claim that everything in Kiemeier is already to be found in Blumenbach and Herder overlooks the fact that Kiemeier discussed more than three forms of the manifestation of living force in his speech – criticising followers of Haller for their inflexible adherence to three only.²⁴⁷ Kiemeier lists five types (sensibility, irritability, reproduction, propulsion, secretion) – but doesn’t really explain how exactly propulsion and secretion fit into the laws he posits regarding the distribution of force. In any case, he has the proviso that this may not be the final word on the matter, and further, he later speculates that this apparent multiplicity is at root one force that differentiates itself and then forms different mixtures:

²⁴⁵ The manuscript included with the *Gesammelte Schriften* ed. Fritz-Holler explicitly mentions species.

²⁴⁶ He stresses this himself in the speech.

²⁴⁷ RF, p.32.

in the same way that light appears split into different rays, and these rays are mixed in infinitely different proportions, the smallest organ, right up to the most complex and immense machine, is set in motion by a single force, a force perhaps was originally awoken by a light whose daily support it still enjoys.²⁴⁸

In fact, Kiemeier has a subtly different principle of ordering to the one Schelling seems to have ascribed to him. The presupposition in the above account is that Kiemeier's ordering seems to result from a commitment to the classical idea of harmony – though not explicitly formulated as a principle – inherited perhaps from Leibniz and the Wolffian school. Insofar as there is a hierarchy of organisms, the most perfect are deemed those with the most differentiated capacities, both within the variety of manifestations between forces, and also forms of a single force, e.g. sensation. Kiemeier writes:

in the series of these formations, the ability to obtain manifold, distinguishable classes of sensations is gradually more restricted from humans downwards.²⁴⁹

Whatever can contain the most oppositions within itself, or the most distinct differences, is the 'highest' animal in Kiemeier's apparent ranking. We might call this the 'most organised' insofar as it is able to unify the most differentiated capacities into one individual (or kind of individual). One way in which this line of thinking plays out is that Kiemeier claims that the number of individuals in a species is offset by the complexity of those individuals – a greater number tend to be simpler.²⁵⁰ This lack of diversity within individuals of a particular kind can be expressed in having fewer senses, or in having a more homogenous build:

the four thousand and sixty-one muscles that Lyonet found in the field caterpillar are far less diversely disposed and much more similar to each other than the far lower number found in humans.²⁵¹

However, it should be noted that despite this apparent privileging of diverse expressions of force within a kind, lack of diversity is able to be offset or 'compensated' for. This kind of language suggests an equivalence can be made between quantity and qualitative diversity: greater mass of the animal, or number of individuals, could be seen to 'make up for' lack of diversity of senses, for example – which could be considered to 'cost' a similar amount of organic force. The factors considered as manifestations

²⁴⁸ RF, p.45.

²⁴⁹ RF, p.33.

²⁵⁰ It makes sense that this is then borne out functionally, in that those animals with fewer senses, for example, are greater in number: these kinds would be less able to survive if not multiplied further.

²⁵¹ RF, p.37.

of the forces that are brought into relation include mass of animal, number of individuals, quantity of senses, power of each sense, etc. – at least when it comes to the question of preserving against destroying force and the species’ persistence in time.

These claims about offsetting, then, appear to somewhat complicate the hierarchy established by Kielmeyer: it no longer seems to be a hierarchy merely based on the capacities for survival and dominance, but rather seems to be an aesthetic judgement about the more ‘organised’ – where organised seems to refer to the complexity of differentiations unified in an ‘organic machine’. Such an attitude is in fact evident from the opening of the work, where Kielmeyer emphasises the wonder warranted by the ‘multiplicity’, ‘manifoldness’, and ‘harmony’ of effects in organic nature, and hence the role of this aesthetic reaction in instigating the study of these phenomena.

To summarise, then: because Kielmeyer is committed to being able to countenance changes in his system – as a result of equilibrium being placed on the level of force instead of number of individuals – and at the same time introducing the idea of compensation, he seems to create a tension in his thought. This tension, I suggest, is between his quest for a hierarchical explanation of natural forms with an economy which makes equivalences between different expressions of force. On the one hand, Kielmeyer gives a hierarchical explanation of natural forms, in which a ‘scale’ is established, with ‘higher’ and ‘lower’ organisms. The relative level of ascendancy of a given type seems to come down to the extent to which diverse expressions of force are unified in particular kinds of organism – the greater the unified diversity, the higher the organism. On the other hand, the formation of his key concepts: equilibrium of force, compensation of force, and the reduction of all forces to one primary force, suggest the possibility of a flatter system. This is because his use of compensation and reduction suggests equivalences can be made between different combinations of expression of force, and that quantity and quality can be counterbalanced *across species in time*. As I will show in the following chapters on Schelling, this is something Schelling takes a different approach to, instead reaffirming a more rigid hierarchy.²⁵²

Summary:

In this chapter I have drawn out possible consequences for Kielmeyer’s account of species based on the distinctive way that he configures his equilibrium model of the organic world’s forces. I have shown that Kielmeyer’s understanding of the species is temporalised in the sense that they may expand or reduce

²⁵² Accordingly, it is not really Schelling’s views on the concept of force that affect his uptake of and responses to Kielmeyer. There is no change with what Schelling says about *forces* with respect to Kielmeyer in these two comments that Schelling made about Kielmeyer’s ‘main idea’.

their share of organic forces (although he doesn't characterise this as a species transformation), and that he entertains the possibility of species extinction. Such temporalisation – together with the emphasis on forces as productive of individuals and species – renders the traditional ways of taxonomic classification at best provisional.

PART II: SCHELLING

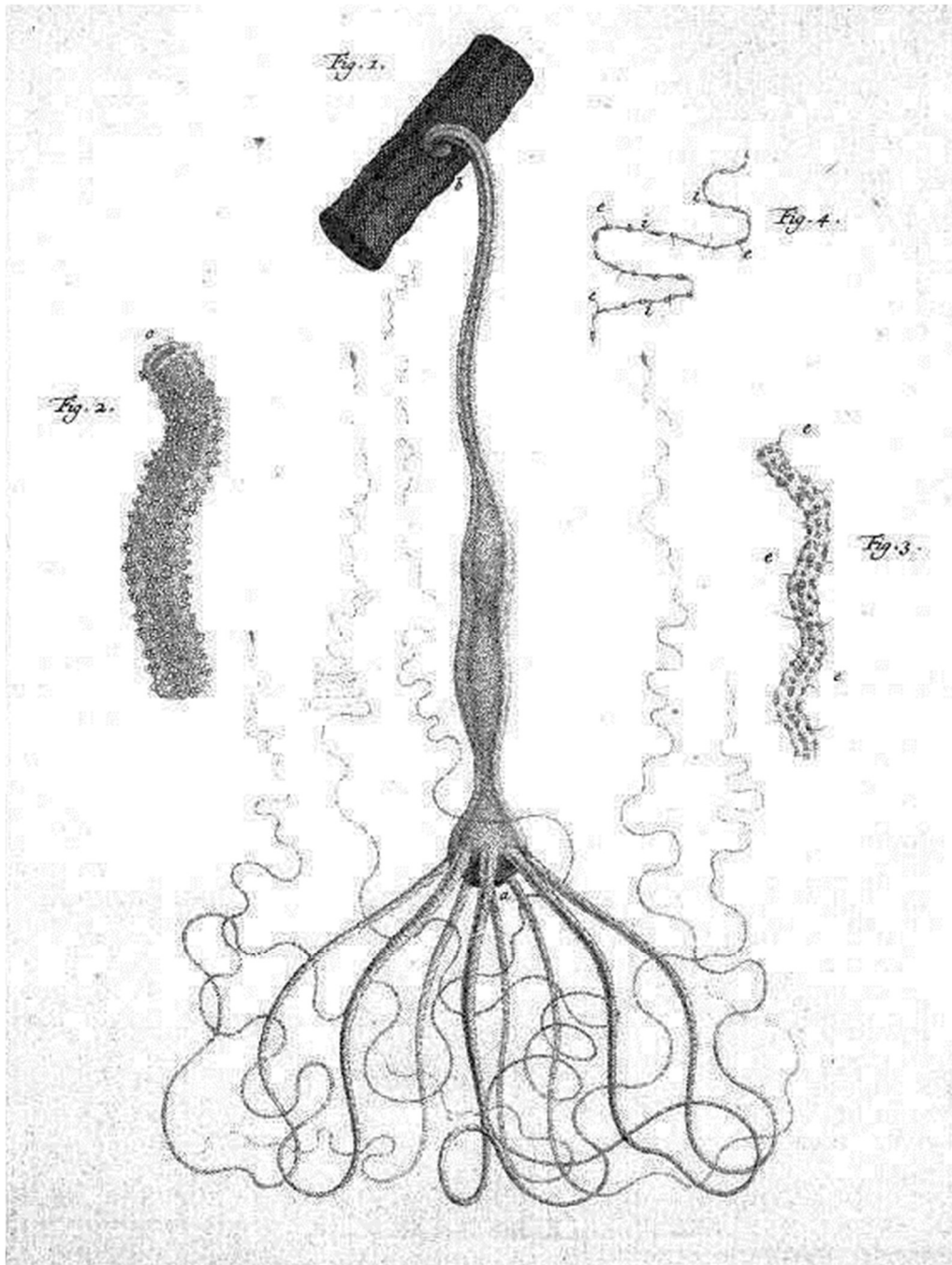


Fig. 6. 'Hydra', Abraham Trembley. *Mémoires, pour servir à l'histoire d'un genre de polypes d'eau douce, à bras en forme de cornes*. (Leiden: Chez Jean and Herman Verbeek, 1744).

5: SCHELLINGS “NATURE”

As with Kiemeier and Hegel, taxonomic issues are not at the forefront of Schelling's engagement with the subject of species. Schelling's approach to the topic of species is framed by his project of philosophy of nature which means that his treatment of species arises in the course of explaining how nature, conceived as infinite activity, can give rise to individual phenomena. This frame has the consequence that in the two areas where species is at issue for Schelling – 1) how the activity of the absolute is presented via the productions of an infinite activity, and 2) how it is that an individual is part of a species – both *focus on activities and processes of formation*.

In this chapter (5), I first develop a reading of Schelling's understanding of philosophy of nature. The goals and methods of philosophy of nature in Schelling's formulation is important for situating his particular approach to the species issue. Given this background, the chapter goes on to look at the way species is situated in Schelling's philosophy of nature, especially in the *First Outline*, and the roles it plays there in organic processes.

Then, in the following Schelling chapter (6) I address Schelling's employment of the notion of species when discussing issue of embryology and the level of determination involved in organic development. The key issue is the understanding developed of the relationship between species members and species concept. To this end, I investigate Schelling's development of a part-whole, 'membership' account of species. I suggest that this approach gives more value to differences in the constitution of identity than other approaches. Finally, I go on to claim that in the species-individual relation either aspect can be seen as prior in Schelling's account. This duality of priority can itself be seen as an organic structure, and moreover, is the result of Schelling's formulation of the project of philosophy of nature as an investigation into both product and productive activity.

I will make the following claims regarding species in Schelling's work.

Regarding the ontology of species, I show that for Schelling a species has a clear shared ontological grounding and an essence in that they are held to express a particular proportion of 'actants'. In expressing a proportion of actants, all instantiations of a given species represent a stage of the absolute.

Schelling's account proposes a clear metaphysical boundary between species difference and variety. He claims that a species expressing a particular proportion of actants is fixed by the presence of sexual

difference in a kind. The central role given to the sexual difference has the consequence that Schelling proposes that proof of identity of species in two individuals is found in their ability to reproduce together.

Because of these commitments Schelling is wary of species transformation. That Schelling's treatment of the species issue is typical of his *naturphilosophische* approach, and accordingly, that too much focus on compatibility of this historical period to post-Darwinian evolutionary accounts, or on taxonomic principles, can detract from drawing out how Schelling articulated species in his own project.

Finally, I suggest that the tension between productivity and product at the heart of Schelling's philosophy of nature is reflected in the way that Schelling articulates the identity relation between individual and species in the *First Outline* – in which individuals express parts of a whole. His understanding of the species-individual relation can also be seen to give a more constitutive value to the differences of individuals.

The Project of a Philosophy of Nature

Schelling gives his most clear discussion of the aim of philosophy of nature in the *Introduction to the First Outline of a Philosophy of Nature* (1799). To summarise, Schelling claims that philosophy of nature posits a 'Spinozism of physics' in which nature is 'self-existent', and consequently tries to explain the *active powers* in nature, the immanent cause of effects, in order to understand the necessity of the phenomena of nature. According to Schelling, as I will elaborate, this is at the same time a derivation or understanding of part from or via the (systematic organic) whole.

Schelling says that his science:

posits Nature (not, indeed, insofar as it is a product, but insofar as it is at once productive and product) as the self-existent; therefore it can most concisely be designated the Spinozism of physics.²⁵³

What is meant by Schelling's assertion that he presents a 'Spinozism of physics' or presents nature 'as the self-existent'?²⁵⁴ Spinozism with regard to nature for Schelling suggests first that he will provide an

²⁵³ FO, p.194.

account of nature without recourse to any creative force outside nature (e.g. a supernatural divinity, mind). He elsewhere reiterates that *Naturphilosophie* posits nature as working from autarchic and autonomous principles – that is, nature is self-sufficient and that it gives its own laws. Because of this, it has the task, in Spinozist fashion, of presenting nature not only as *natura naturata* ('nature natured', created or produced nature), but also focuses on *natura naturans* ('nature naturing': productive or active nature – which cannot be located outside nature if it is truly autonomous and autarchic).

Derivation of part from whole to understand the necessity of phenomena

Schelling is careful to distinguish this project of *Naturphilosophie* or speculative physics from what he took to broadly be the scientific approach of the day: "so-called empirical physics".²⁵⁵ Schelling's remarks against 'empirical physics', in the *Introduction* published after the *First Outline*, in combination with his endorsement of what he calls an 'a priori' method as part of his speculative physics, are two likely (at least in part) sources of the misconstrual of Schelling as anti-empirical in his stance – a picture of Schelling which recently scholars have worked to overthrow.²⁵⁶

Regarding the first point, Schelling's rejection of 'empirical physics' as the project to be undertaken in *Naturphilosophie* does not mean that he rejects the import of experience as a vital aspect of knowledge. Throughout the *Outline* Schelling constantly refers to contemporary phenomena and experiments in order to support his assertions, insisting that the explanations derived must not only accommodate but also explain those phenomena.²⁵⁷ His goal was thus not to disregard, nor to reject empirical findings. In a note accompanying his 'Introduction' to the *First Outline*, he explained that –

The assertion that natural science must be able to deduce all its principles a priori is in a sense understood to mean that natural science must dispense with all experience, and, without any intervention of experience, be able to spin all its principles out of itself; an affirmation so absurd that the very objections to it deserve pity.—Not only do we know this or that through

²⁵⁴ Beiser takes this phrase to be crucial to Schelling's naturalistic and anti-Fichtean re-envisioning of his project of *Naturphilosophie* in FO; see Beiser, *German Idealism*, p. 530; for an account of how Schelling's relation to Spinoza changes, with a focus on Schelling's 1801 *Presentation of My System of Philosophy*, see Yitzhak Melamed, 'Deus Sive Vernunft: Schelling's Transformation of Spinoza's God', in G. Anthony Bruno, ed., *Schelling's Philosophy: Freedom, Nature, and Systematicity*, (Oxford University Press, 2020) pp. 93-115.

²⁵⁵ FO, p.196.

²⁵⁶ As Schelling is often taken to promote wild speculation in place of empirical research, a few preliminary comments are required. In recent years scholars have strongly refuted readings that portray Schelling as anti-empirical and consequently characterise *Naturphilosophie* as having had a negative effect on the progress of science, e.g. Nassar, in *The Romantic Absolute* (2014) emphasises his proximity to Goethe, and the import of the idea of experimentation. In line with this, I claim that although he is ultimately an idealist philosopher, empirical findings and developments in the emergent life sciences were nonetheless of upmost significance for Schelling's philosophy.

²⁵⁷ E.g. in empirical research, one "justifiably uses the shared fertility of species thought to be distinct as proof that they are merely variations of the same genus or species". FO, p.43.

experience, but we originally know nothing at all except through experience, and by means of experience, and in this sense the whole of our knowledge consists of the judgments of experience.²⁵⁸

His philosophy of nature, then, cannot be understood as a straightforward rejection of the role of empirical: this renunciation of “so-called empirical physics” must have another meaning: that the very distinction between the speculative and the ‘empirical’ in this case is false. The idea of a pure empiricism is itself questioned, as it involves implicit judgements that the empirical scientist does not wish to acknowledge. Maybe Schelling’s goal is in part to avoid the pretence of a purely receptive scientific agent. But I want to stress here that it is also due to his understanding of knowledge and the requirements for possessing it that his idea of speculative physics takes shape. Of knowledge “in its strictest sense” he explains that:

we can be said to know objects only when they are such that we see the principles of their possibility, for without this insight my whole knowledge of an object, e.g., of a machine with whose construction I am unacquainted, is a mere seeing, that is, a mere conviction of its existence²⁵⁹

For Schelling then, to really be explanatory, truly scientific knowledge must approach objects in a different way – via comprehension of the ‘principles of their possibility’.

The difference then lies in the type of *causes* investigated by speculative physics, which:

occupies itself solely and entirely with the *original causes of motion in Nature, that is, solely with the dynamical phenomena*; the latter [empirical physics] on the contrary, inasmuch as it never reaches a final source of motion in Nature, deals only with the secondary motions, and even with the original ones only as mechanical (and therefore likewise capable of mathematical construction). The former, in fact, aims generally at *the inner clockwork and what is nonobjective in Nature; the latter, on the contrary, only at the surface of Nature, and what is objective and, so to speak, outside in it.*²⁶⁰

So what Schelling means by a priori is not so much a Kantian definition (judgments that do not require recourse to experience to confirm their validity), but perhaps follows an older one such as the one given

²⁵⁸ FO, p.198.

²⁵⁹ FO, p.196.

²⁶⁰ FO, p.196.

– according to Miller – perhaps by Ockham and which found a canonical modern formulation in Arnauld's *Port Royal Logic*.²⁶¹ In Arnauld's discussion of the geometrical method, "to reason a priori is to prove the effect from the cause". Again, targeting Kant, Schelling writes that

the distinction between a priori and a posteriori judgments is not at all, as many people may have imagined, one originally cleaving to the judgments themselves, but is a distinction made solely with respect to our knowing, and the kind of our knowledge of these judgments, so that every judgment which is merely historical for me—i.e., a judgment of experience—becomes, notwithstanding, an a priori principle as soon as I arrive, whether directly or indirectly, at insight into its internal necessity.

The reason we can gain insight into the internal necessity of our partial ideas is because nature is one system that progresses from the idea of nature as a first principle. This is again a Spinozist claim. In other words, seeing the necessity of a thing is to see how it (as a part) is related to and dependent on the whole. He writes that:

for the very reason that Nature is a system, there must be a necessary connection, in some principle embracing the whole of Nature, for everything that happens or comes to pass in it. — Insight into this internal necessity of all natural phenomena becomes, of course, still more complete, as soon as we reflect that there is no real system which is not, at the same time, an organic whole. For if, in an organic whole, all things mutually bear and support each other, then this organization must have existed as a whole previous to its parts; the whole could not have arisen from the parts, but the parts must have arisen out of the whole. It is not, therefore, that WE KNOW Nature as a priori, but Nature IS a priori; that is, everything individual in it is predetermined by the whole or by the idea of a Nature generally. But if Nature is a priori, then it must be possible to recognize it as something that is a priori, and this is really the meaning of our affirmation.²⁶²

To briefly summarise, Schelling is clear that 1) his philosophy of nature is intended to be an independent science, not a replacement for other methods of enquiry. This science has to 2) be able to explain empirical phenomena. The fundamental approach of philosophy of nature is to address not just at apparent products in nature, but 3) also the productive activity thought to underlie them; the original, non-objective causes of motion. Schelling's philosophy of nature will therefore 4) situate an

²⁶¹ Arnauld, *Port-Royal Logic*, IV.1. See Jon Miller, "Spinoza and the "A Priori", *Canadian Journal of Philosophy* Vol. 34, No. 4 (Dec. 2004), pp. 555-590.

²⁶² FO, p.198.

explanation of apparent products (empirical phenomena), or parts, in a whole, which is to provide an a priori derivation of them.

The Place of Species in Schelling's Philosophy of Nature

The previous section sketched Schelling's characterisation of the philosophy of nature. In terms of the project of this philosophy of nature, then, Schelling aims to explain phenomena (products) from an original activity in nature (productivity) that is not itself a phenomenal object. This is, again, because philosophy of nature wants to connect the original causes in nature to natural products.²⁶³ At the same time, avoiding the positing of supernatural forces to explain phenomena.

In the *First Outline*, Schelling tries to explain the phenomenal organic individual, for example, from the initial posit of nature as 'the unconditioned' or '*infinite activity*'. This infinite activity is of course itself not able to be empirically demonstrated, but it must, for Schelling, be posited in order to explain the processes of the natural world and their phenomena.²⁶⁴ Schelling's resulting metaphysics is intended to show what conditions must be necessary in order for empirical phenomena, or "apparent products", to be explained.²⁶⁵ The aim of this section is to explore how natural kinds – or more precisely, plant and animal species ['*Gattungen*'] – fit into such a project. I will suggest that Schelling makes the following claims:

1. in apparent products (organic individuals) species are necessary.
2. species constrain the expression of the absolute in individuals, but at the same time, allow it to appear,
3. members of a species share what Schelling calls a stage of nature, in that the members express the same proportion of actants/forces
4. the stages are fixed by sexual development, meaning that species cannot change into other species

To give an extremely brief overview, Schelling's sketch moves from the positing of the productive, infinite activity, to explain 'apparent products' through deduction of the series of nature's stages.

²⁶³ FO, p.211.

²⁶⁴ see e.g. Schelling FO, p5: "it must simply be posited into nature, and it is the first postulate of all philosophy of nature".

²⁶⁵ As Peterson notes, this is at the same time an inversion of the traditional Aristotelian question of philosophy of nature, which asks how an object can change whilst remaining self-identical, and instead seeks to explain "how products appear to be permanent at all in this continual flux". see Peterson, 'Introduction', FO, p. xxix.

First, what are ‘apparent products’? With the consideration of natural phenomena as ‘apparent products’ Schelling indicates 1) that each ‘product’ must itself be able to form further products (nature is not exhausted in the individual product), that 2) what we consider to be objects are actually the dynamic result of opposing forces, or processes. In a very abstract way, any individual can be understood at root not as inert finite substances but as phenomena created by processes. Schelling uses a whirlpool image to frame the individual as an effect generated by opposing forces: where an activity with no resistance would immediately exhaust itself, an infinite activity that is infinitely inhibited, or opposed by a contrary force explains eddies in the course of nature.²⁶⁶ Finally, Schelling’s use of the plural is to be downplayed, given his reference to ‘*apparent* products’ [my emphasis], which signals 3) that everything that appears, the ‘*naturata*’ of nature, is actually one product which he thinks is inhibited at different stages. In fact, because nature is ultimately one activity (infinite activity cannot have anything outside it or be limited by anything other than itself), what is produced by this activity is, for Schelling, also one product.

Schelling’s further analysis aims to provide a deduction of stages in nature from the original ideal division between productive activity and inhibiting activity. Because this deduction is intended to focus on necessary conditions, these are not meant to reflect a sequence of temporal stages of nature but instead are logical stages. The account proceeds from the initial assumption of nature as infinite activity, through various distinct physical, chemical and ultimately organic processes.

The difference between the stages that express nature’s activity is what Schelling holds responsible for different species of organism. He writes, “the variety of stages alone constitutes the variety of organisms.”²⁶⁷ Each different stage is a different species (and this ‘variety’ of stages is distinct from the variation that also occurs within a stage or species). When we think about the individual phenomena, we may notice certain similarities and differences in shape. But these are consequences of the stage they reflect:

But what then is the stage of development itself? It is indicated by a certain shape. this determinate shape is itself only a phenomenon. The real, which is its foundation, is the inner proportion of forces which is originally found in each organism.²⁶⁸

²⁶⁶ “A stream flows in a straight line... as long as it encounters no resistance. Where there is resistance—a whirlpool forms. Every original product of nature is a vortex, every organised being. E.g., the whirlpool is not something immobilized, it is rather something constantly transforming—but reproduced at each instant through the force of nature entire. (We do not really see the subsistence of nature’s products, just their continually being reproduced)”. Like Kierkegaard, Schelling’s system operates in a broadly Heraclitean vein where objects and their apparent substantiality can be understood as a result created by continual motion.

²⁶⁷ FO, p.434.

²⁶⁸ FO, p.434.

Schelling claims that species have “original natural predispositions”,²⁶⁹ and that these are distinguished by having their own particular proportion of initial actants or forces that are present in each individual in some way (this will be explained further in the discussion of embryology below).

Given this background, species appears in the context of the question: how can nature be inhibited at particular stages, without its activity ending?²⁷⁰ Schelling’s account uses his theory of sex to explain this, as I elaborate in the following section.

The Roles Assigned to Sex Difference

I turn now to provide an account of the role of sex in organic nature; although scholars to date have been right to emphasise the importance of sex for Schelling – it is essential in organic nature – I will suggest here a particular role regarding species.²⁷¹ Schelling uses his idea of sexual difference itself to explain the inhibition of organic nature at different stages. It is accordingly sex difference that is the reason why products appear fixed; nevertheless, he claims that this does not mean that nature is no longer active – this activity can be seen in the continual reproduction and death cycle.

The degree of importance Schelling places on sex difference in organic phenomena is clear from his claim in the *First Outline* that “absolute sexlessness is nowhere demonstrable, and an a priori regulative principle requires that sexual difference be taken as a point of departure everywhere in organic nature”.²⁷² On the surface level, this belief colours Schelling’s descriptions of various organic phenomena, for example, he disagrees with the claim that budding plants are sexless, and regarding animals, “even polyps” are thought to be sexed.²⁷³ But with this claim about sex as the point of departure in organic nature, Schelling also makes sexual duality essential to of organic nature. In doing so, Schelling attributed what Lettow has noted as a structural significance to sexual duality in nature.²⁷⁴ In *On the World Soul*, too, he had also attributed significance to nature’s (alleged) sexual dimorphism, where it was framed as a consequence of the more general value Schelling placed on the principle that

²⁶⁹ FO, p.49.

²⁷⁰ FO, p.35: “the problem arises: to specify how nature could inhibit its product at particular stages of development, without ceasing to be active itself”.

²⁷¹ For accounts of the role of sex in Schelling, see e.g. Alison Stone, ‘Nature, Freedom and Gender in Schelling’. in G. Anthony Bruno eds, *Schelling’s Philosophy: Freedom, Nature, and Systematicity* (Oxford University Press, 2020).

²⁷² FO, p.36.

²⁷³ (Apart from some insects that he claims direct the formative drive toward technical rather than sexual production, at least initially).

²⁷⁴ Lettow writes that “Antagonism was thereby articulated via a theory of sexual difference which was understood as the fundamental structure of nature in general.”. Lettow, ‘Modes of Naturalisation: Race, Sex, and Biology in Kant, Schelling and Hegel’, *Philosophy and Social Criticism* 39 (2013): 122.

opposition requires an underlying unity, which he had applied to other phenomena like magnetism and electricity. Claiming that “a dualism of this sort is found in the first principles of philosophy of nature”, Schelling adds that

that only beings belonging to one physical species are fertile with each other and vice versa, the supreme principle of all natural history (see Girtanner on the Kantian principle of natural history, p. 4 ff.) follows only from the general principle of dualism (which is confirmed in organic as well as inorganic nature) that there is real opposition only between principles of one kind. Where there is no unity of kind there is no real opposition, and where there is no real opposition there is no procreative force.²⁷⁵

This emphasis on sex, as Lettow puts it, summarising Stefani Engelstein’s paper, was not the only way that generation was conceived of at the time.²⁷⁶ As they point out, sex duality formed a “metaphysical condition” of Schelling’s philosophy of nature in a way that was certainly not the only theoretical option of the day. In Schelling, this stress on duality of sex (with an underlying identity of type) is used to explain how nature’s activity can be manifest in different organic stages. Schelling argues that the sex separation is the ground of inhibition in nature’s production of a series of stages, writing that “the variety of organisms is finally reducible just to the variety of the stages at which they separate themselves into opposed sexes”.²⁷⁷

This is described as an inhibition, on the one hand, because it arrests the productivity at a specific proportion, as noted above. But on the other hand, it is also described as a continuation in that the appearance of sex is not an end to nature’s activity. but nature is still active: “nature is actually inhibited in its productions by means of this separation, without on that account ceasing to be active”. How can nature be at the same time continually active in the product, whilst being inhibited to a specific stage? And how does sex feature in this explanation?

Schelling’s claim seems to be that nature’s appearance in *sorts* of organisms – species, perhaps – can be determined by the appearance of sex difference in those organisms.

the difference of the sexes... is the genuine and sole reason why (organic) natural products appear fixed. (But they are not in the least fixed. The individual passes away, only the species

²⁷⁵ VDW, section 5, remark.

²⁷⁶ Susanne Lettow, ‘Conceiving Reproduction in German Naturphilosophie. Introduction.’ *History and Philosophy of the Life Sciences*, 43 (2021).

²⁷⁷ FO, p. 42.

remains, but nature never ceases to be active. However, since nature is infinitely active, and since this infinite activity must present itself by means of finite products, nature must return into itself through an endless circulation.)²⁷⁸

The claims seem to be 1) that fixity is because of sex difference, 2) that when sex difference is present a species can only reproduce itself,²⁷⁹ and 3) that this fixity is only ‘apparent’ because of the dialectic Schelling outlines between nature, species, and individual. The aspect that appears fixed is the species, which retains self-identity in the reproduction of different individuals. Finally, the endless circulation Schelling refers to is that the death of an individual doesn’t mean the end of nature’s activity, and that nature produces ever new phenomena.

Like Hegel after and Kierkegaard before, Schelling uses the notion of species to understand organic activities. In Schelling and Hegel, this includes sex, death, and illness. If we consider the role of the development of sex not in terms of nature as a whole but instead in the temporal development of an individual organism, On Schelling’s account, when an animal or plant grows to reach the “highest stage” of its individuality, this is marked by its “peak sexual development”. Put very plainly, this could be seen as a transition from the development of an organism (growth) to the point where it is potentially able to produce offspring. Once the individual organism has reached this stage, he claims, it is “no longer the object of natural activity but instead means and instrument.”²⁸⁰ This means that in the effort of the organism to reproduce, for Schelling, the activity of nature is still present, but that this activity becomes the organism’s own reproductive activity, and in this way is an organ of nature’s activity. This also forms part of Schelling’s explanation of death, because once it is no longer reproductive, Schelling claims that “from now on the individual will be a limit to its [nature’s] activity, which nature labours to destroy.”²⁸¹ In this way, again, we can see that Schelling explicitly connects *Gattungen* to organic processes (death, reproduction), which is unlike his treatment of mineral kinds, for example. In FO Schelling seems to imply that he thinks that different rocks of the same type are not members of a species. Instead, kinds of minerals, for example, are thought of as individuals.

²⁷⁸ FO, p. 42.

²⁷⁹ The reference I make to the species reproducing itself and self-identity in this paragraph will be elucidated further in the following section, which more closely examines the type of identity species has on Schelling’s account. Schelling claims that when divided into sexes the product “no longer completely expresses the character of the stage of development at which it stood”, and that “further development is deranged by that separation and is inhibited at this stage”. He adds that “that the product is inhibited at a stage of development doesn’t mean that it absolutely stops being active but that it is limited w respect to its productions; it cannot produce anything to infinity except itself. since it is now perpetually active, it will be active only for itself, i.e. it will reproduce itself not only as individual but simultaneously as genus to infinity (growth and reproduction) [...] however, no organism can reproduce itself as genus which has not reached the stage of separation into opposed sexes”. FO, p.47.

²⁸⁰ FO, p.40.

²⁸¹ FO, p. 41.

Variation

As I have discussed above, Schelling distinguishes stages of inhibition in nature's activity as certain proportions, which are manifest as kinds. He holds the appearance of sexual differentiation responsible for setting the bounds of these stages. In this way, Schelling makes a clear ontological distinction between species and variety – the various expressions of that species proportion in individuals.

To go along with this ontological distinction is an epistemological claim about how one comes to know the difference between species and variety within a species. Schelling defends the epistemological strategy of searching for individuals which can reproduce together (reminiscent of a reproductive species concept) to show that they are of the same species:

in empirical research one justifiably uses the shared fertility of species [*Arten*] thought to be distinct as a proof that they are merely variations of the same genus or species [*Gattung oder Arten*]²⁸²

and elsewhere:

it therefore remains a problem for the natural scientist to discover precisely these original natural predispositions, so that he does not reckon mere variations on an original plan as diverse species.²⁸³

Whether or not individuals are of the same species is therefore theoretically independent of morphological differences, to the point where Schelling will redescribe species boundaries:²⁸⁴

the interbreeding of differently classified species has completely transformed one into another, although this transition is a proof that those differently classified species were only different variations of the same species²⁸⁵

Strangely, he also comments that the hyena and 'Bolognese dog' can be seen as two extremes of a species, containing the varieties of fox and wolf as well. As far as I know, foxes and wolves cannot

²⁸² For this reason he claims that all human races must come from one shared "primeval original". FO, p. 45.

²⁸³ FO, p.49.

²⁸⁴ It is odd that Schelling doesn't consider exceptions to this proposed rule.

²⁸⁵ FO, p.45.

reproduce together, and either Schelling didn't know this (which I find unlikely), or he would have had to find an explanation for their inability to reproduce together.

If species boundaries are fixed, how does Schelling understand variety of individuals within a species? Schelling's account of variation requires a bit more unpacking. How can individuals share a species and yet be different? And how can varieties develop, on his understanding of nature? This tension in the way that he thinks of the relation between species and individual, I argue, is the consequence of the way his project (of philosophy of nature) is framed, that is, a result of the attempt to think nature not only as product but also as productivity. This has the result that his understanding of identity necessarily also embraces differences, due to the mutual determination between individual and species.

Summary

I have suggested that Schelling's philosophy of nature emphasises looking not just at nature as *naturata*, but as *naturans*, and so seeks the underlying activities of nature, not just effects. I argued in turn that Schelling proposes sex differentiation as the way the productions of nature appear fixed at given stages. Following this, I suggested that the role Schelling provides a common identity to species members by means of the idea that each species member expresses the same proportion of forces in a different way. Finally, I suggested that it is possible to read Schelling as offering an account of the species where individuals also contribute to that species, rather than merely instantiating it.

6: THE ROLE OF SPECIES IN INDIVIDUAL DEVELOPMENT:

In Schelling's discussion of the embryological development of individual organisms in *The First Outline*, he claims to support "epigenesis", or "dynamic preformation". In this section I address what this claim reveals about the role given to species in the development of individuals, and how the resultant relation of identity between individual and species is articulated. I suggest that Schelling rejects preformation of *individuals*, as well as preformation that would entail mere mechanical expansion on the part of the individual. But does not necessarily reject preformation in every respect. He argues instead for a preformation at species level, as a proportion containing various potentials as tendencies. This is both a historically interesting view in its own right and crucial to understanding the view of species and its ontological status that I would like to ascribe to Schelling. In particular, it shows the importance of attention to the details of Schelling's approach to phenomena in the overall picture he advances.

Criticisms of Traditional Accounts of Embryology

Although Schelling advances what he calls a "dynamic preformation"²⁸⁶ to explain embryology in the *First Outline*, on several issues, Schelling is keen to stress that he rejects a certain form of the preformation theory of embryonic development. Variants of preformationist accounts were held by Swammerdam, Albrecht Haller, and Charles Bonnet. Schelling refers to the theory's defence in Swammerdam, but he was also likely at least familiar with Haller's version (Haller's ideas are referenced in other contexts in the *Outline*). The key components of preformation as understood by Schelling, can be summarised as 1) the mature form of the plant or animal already lies fully articulated in the seed, and 2) the development of the individual happens by means of the expansion of these parts. Given this interpretation, Schelling's main criticisms focus on the difficulty of this account in explaining the empirical phenomena of experiments in polyp reproduction and of that of the metamorphoses of insects.

With regard to the first point, it is clear that there is room for various interpretations of the way the mature form could be contained in the seed on a preformationist account. As Richards points out, in

²⁸⁶ A note on Schelling's use of the term 'dynamic' here, as 'dynamic preformationism' seems to be his own term. In the opening of Schelling's *First Outline*, which I have sketched in chapter 5, 'dynamic' is connected first and foremost to philosophy which is not mechanical (as he claims in the preface), as well as to the notions of productivity and freedom. Here, however, 'dynamic' occurs in the very localised context of the species concept in embryology. In this section and the following my exegesis suggests that 'dynamic' refers to the interaction of tendencies with environmental factors and that what will actually come to pass is not fully determined by these tendencies alone.

fact, this pre-existence of the mature form meant “that the generative material was predelineated ‘in ideas and types according to a rational similitude’.”²⁸⁷

For our purposes, we should note that when Schelling criticises preformation, he understands the ‘form’ implied in the sense of *morphé* rather than the sense of *eidos*: that is, he holds them to be advancing a figural preformation rather than an intelligible or ideal one. We can see this, for example, when criticising the idea that “in such a seed all parts of the individual – to the infinitely small (individually preformed) are present”,²⁸⁸ Schelling takes aim at an understanding of preformationism that holds that the form that the developed individual organism will take is contained in the embryo on a miniature scale. It seems he thinks that they advance a figural preformation because he criticises it not only on rational but also on empirical grounds. Nevertheless, even if Swammerdam’s own account was less straightforward than the view criticised by Schelling, something similar had been proposed in some prior preformationist theories, such as von Hartsoeker’s (1694) homunculus theory. And further, although in the quotation above, Swammerdam’s use of empirical findings as proof may nevertheless suggest that he at the very least anticipated empirical correlates of preformation of parts in figure.

Schelling has several reasons for rejecting this figurative kind of preformation. First, that there is insufficient empirical evidence to support it, second, that we do observe empirical phenomena that the preformationist explanation cannot easily accommodate, and finally, that it creates difficulties resulting from the mechanism entailed, and his more general underlying commitment to reject the involvement of supernatural forces in the explanation of nature.

First, according to Schelling,²⁸⁹ microscopy had not revealed sufficient evidence to support such a claim. Although Swammerdam claimed to have found evidence of the preformation of insects, even in a case with a seemingly radically transformation from caterpillar to butterfly, for Schelling, these observations were not able to prove the pre-existence of parts *before* metamorphosis began to occur. It only showed that once some parts begin to be discernible (of organs, for example), the process of development is already underway, and those discernible parts are already elements of that process. He writes that:

if this [Swammerdam’s] example is really supposed to prove something, then one ought to be able to show even in the pupa in its first moment of formation – one

²⁸⁷ Richards, *The Meaning of Evolution*, p.7

²⁸⁸ FO, p.47/ EE, p.57: „...der Grund also, warum jede Organisation ins Unendliche fort nur sich selbst reproduciret, ist, in der *ursprünglichen* Beschränktheit ihres bildenden Triebs, nicht aber etwa in praeformirten Keimen zu suchen, für deren Wirklichkeit man auch nicht einen Schatten von Beweis hat.“

²⁸⁹ Again, Schelling is perhaps selective in his citations here; he ignores, for example, Haller’s chicken experiments.

ought to be able to show already in the caterpillar, those parts as individually preformed.²⁹⁰

And there is therefore “no reason to assume that in a seed all parts of the individual to the infinitely small are present”.²⁹¹

Given this lack of compelling evidence, Schelling frames preformation as an unnecessary assumption (from the perspective of parsimony). But Schelling’s rejection of preformation is not only based on the lack of supporting empirical evidence, as he puts it there: “is no proof at all for the assumption, but surely there are proofs against it”²⁹². To Schelling, the presence of empirical phenomena that preclude explanation via preformation these are phenomena that permit of his *a priori* explanatory proof.

To Schelling, preformationism could not explain the results found in particular novel experiments in regeneration, carried out first by Abraham Trembley (1710-1784). Trembley’s research involved bisecting and rearranging polyps (hydra), which would often then regenerate themselves or develop into two organisms. How, according to preformationism, Schelling asks, “are the reproductions of the lower species explicable?” Noting the observable multiplication of polyps (freshwater hydra) as a reaction to being cut up by the scientist, he asks - “what is the life principle of the seed here? the knife of the researcher?”. The preformationist cannot, according to this challenge, predict the apparent gratuity of the human agent’s interaction with the polyp, the objection seems to be that preformationism makes it hard to explain contingent reproductive or regenerative events (if the right number of parts or individuals would have to be already contained).²⁹³

Schelling notes a further difficulty in the attempt to explain the observation of other developmental phenomena (aside from those of embryogenesis) with the logic of preformation. His critique of preformationist accounts is also tied to the importance of adequately accounting for metamorphoses, such as the metamorphoses of certain insects. Citing examples of metamorphoses, e.g. caterpillar to butterfly, where we observe a dramatic transformation in an individual’s form, the explanatory value of preformation, given our attempt to understand the further development of animals, proves incomplete. He notes:

²⁹⁰ FO, p.37.

²⁹¹ FO, p.47.

²⁹² FO, p.37.

²⁹³ E.g., if one small, fully formed morphological unit simply expands in growth, when a piece of the polyp is cut off, yet manages to reform itself. Schelling is perhaps being a bit disingenuous here in how he reads preformation theory (considering for example that Bonnet used Trembley’s experiments to support preformationism) and seems to be arguing against the weakest formulation of it. But my goal here is not to assess Schelling’s arguments but rather to draw out his commitments and what they mean for his account of the role of species.

[W]hen the emergence of new parts is explained as preformation, how does one explain the disappearance of parts that were there before?²⁹⁴

If they are not completely transformed, but replaced by the growth of new miniature forms – where do the previous parts go? To Schelling, such observations do not comfortably fit preformation. Rather than being explained by one form being completely shed to make way for another, with no material continuity underlying that change, Schelling asserts that

these phenomena prove that the metamorphosis of insects does not occur by the mere evolution of already preformed parts, but rather, through actual epigenesis and total transformation.²⁹⁵

Because of this, he writes that we need only assume “a multiplicity of tendencies”²⁹⁶ to explain organic development, not a pre-existing form. Indeed, he adds that the seeds are already themselves products of the activity of these tendencies.²⁹⁷ I will return to these two aspects, that is the preference of tendencies over a pre-existing form, and the determination of the direction; but for now we will look more closely at the philosophical underpinnings of Schelling’s rejection of this kind of preformation.

Schelling’s rejection of this characterisation of preformation is in line with his wider rejection of mechanism as the model of causation. The type of containment Schelling criticises had often been accompanied by a form of creationism in which a creator would have placed in the first of every species the seeds for every following generation, nestled within one another, only to mechanically expand on the occasion of the right external conditions – which could mean that organisms would be understood as developing entirely passively. The reason for this happy accompaniment of preformation with creationism lay in the issues arising from the mechanical conception of natural world. In (at least) two senses, a mechanistic picture of nature required some supernatural (non-mechanical) explanation for the instantiation this preformation in the first instance. First, the ultimate initiation of events can’t be explained via efficient causality alone. Schelling’s critique of Lesage, for instance, is based on this rejection. He writes that

²⁹⁴ FO, p.37n.

²⁹⁵ FO, p.38.

²⁹⁶ FO, p.47.

²⁹⁷ It is noteworthy that he uses the same word – *tendenz*, the same word that appears in his explanations of physical and chemical nature.

the first problem of this science, that of inquiring into the *absolute* cause of motion (without which Nature is not in itself a finished whole), is absolutely incapable of a mechanical solution. Because mechanically motion results only from motion to infinity.²⁹⁸

Thus, mechanism cannot *of itself* provide an absolute cause of motion. Secondly, it is not only the cause of motion that is at issue, but also the apparently purposeful arrangement of parts in organic structures.²⁹⁹ Explanation of the cause of this arrangement, if only efficient causality can be assumed (often argued via analogy with technology, i.e.. a watch) again required positing a creator's intent to institute the apparent teleology externally. Both these ideas and their supranatural requirement would be rejected by Schelling. To summarise, Schelling rejects preformation of individuals, especially in terms of figure, because it would mean that organic growth is explained as a passive phenomenon, and that would create issues with his naturalist philosophy of nature.

The role of species in Schelling's positive account of embryology

With the declaration that development occurs through "actual epigenesis",³⁰⁰ and that this occurs via "a multiplicity of tendencies", Schelling claims to join C.F. Wolff, Blumenbach (and more distantly, Aristotle) in articulating an epigenetic theory to explain embryonic development. Rather than the unfolding and expansion of preformed parts or wholes from a seed, epigenetic theories explained the development of organisms as a gradual or sequential process, in which the organism became increasingly determinate as it developed from an unformed state (rather than mere expansion of what was already fully determinate).

As I explained in chapter 2, Blumenbach and Wolff had turned to vitalist accounts to explain this process. These vitalist accounts posited that the forces governing animate nature are of a different kind to those mechanical causes that comprised physical processes. Schelling, however, was wary that such lines of argument might be seen to claim the existence of unnatural forces, and he is careful to qualify that "we will make use of his [Blumenbach's] concept, as long as we are able to lead this concept back to natural causes",³⁰¹ Schelling thinks that the *Bildungstrieb* is itself a result of opposing forces. In

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²⁹⁹ Farley, John, *The Spontaneous Generation Controversy from Descartes to Oparin*, (Baltimore: Johns Hopkins University Press, 1977), p. 29; cited by Fry, Iris, *The Emergence of Life on Earth. A Historical and Scientific Overview*, (New Brunswick: Rutgers University Press, 2000). Fry 2000, p. 26.

³⁰⁰ FO, p.38.

³⁰¹ FO, p.48. In addition, it is very important to Schelling that the developmental force is not itself simple but is composed of opposing tendencies.

Schelling's account, all that need be posited are "a multiplicity of tendencies". Tendency [*die Tendenz*]³⁰² implies an inclination to develop in a certain direction – in Schelling's terms, an orientation towards which "[the organism's] activity must be directed". These tendencies already have direction; unlike mechanical forces which are pushed from outside. He writes that the tendencies or activity of the formative drive in the germ or seed, "as soon as they are set into activity, must develop according to antecedently determined directions".³⁰³ Exactly how the direction is determined, and the degree of consequent determination (given environmental interaction) will uncover the degree of determination, and its necessity proposed here.

Schelling also explicitly connects the formative drive to the concept of excitability in the notes. This is of interest because the concept of excitability (adopted and expanded from Brunonian medicine) is his grounding explanation of life as the reciprocal determination of activity and receptivity. This simultaneous activity and receptivity is the condition of organic life because it is the condition of the organism's individuality: both activity and receptivity have to be present for the organism to exist as something that is relatively independent from the rest of nature (differentiated).³⁰⁴

However, whilst for the preformationists, the form of every *individual* was already anticipated before development in the first of every type, for Schelling, this determination is too specified. He states that "we agree with Blumenbach that there is no individual preformation in nature, but only a generic kind"³⁰⁵ Schelling adds that:

although as a rule nature expresses the original of the genus in the production of the individual, it deviates from this as soon as it is compelled, e.g. as soon as any injury to the organism or accidental lack is to be compensated. So here nature produces something whose production could not be calculated because it depends on an accidental condition – something that also could not be preformed.³⁰⁶

Thus not only is deviation possible; deviation from the original genus is *dependent* on accidental conditions, which could not be stipulated already by the genus. Again, this would make sense as it

³⁰² He equates these tendencies to the formative drive, like Blumenbach (again, provided that these tendencies are explained as consummate with the system of nature as a whole).

³⁰³ FO, p.47.

³⁰⁴ he adds that "highest activity is = to the negation of all activity, the maximum activity to maximum capacity" (I take this to mean that either total activity or total receptivity are death, basically – activity and object require each other to be what they are.) *ibid.*

³⁰⁵ FO, p.47n. In this, Blumenbach, (and Schelling) were influenced by Buffon's *Natural History*, where he had offered an explanation of epigenesis using the notion of a 'moule intérieur' [internal mould] which differed for each species.

³⁰⁶ FO, p.47n.

allows him to incorporate environmental influences into the developmental process. To say that organisms cannot be preformed because they depend on accidental conditions may seem strange when considering the perspective of nature as a totality: as both the generic determination as well as the accidental occurrence that individual responds to are both parts of nature as a whole.

I think making a clear distinction between what is preformed (at the level of genera) in the seed, vs what is determined by the totality of nature (including the influence of the environment) can resolve this issue. Thus, at the outset of embryonic development, the “original disposition for such a constitution is originally laid already, and must only wait for the developing influence of external causes”.³⁰⁷ Because of this interaction, there is “no mechanical evolution”, no simple unfolding, but only a “dynamical one.”³⁰⁸

To return to the issue of Schelling’s distinction between species differences and variety internal to species, here Schelling shows more clearly that diversification within a species is itself a necessary part of nature’s activity:

the product is fixed. but to what extent? each product of nature can split again into new products. nature organises, where it organises, to infinity. The product is then limited to this determinate sphere of formation, ... but within this sphere still narrower spheres can again be formed. Although the product is fixed as *species*, it is still not fixed in every respect.—if the productive drive does not any longer proceed from the center to the periphery, then it goes from the periphery to the center; i.e.. when the sphere of formation is no longer to be expanded, then narrower spheres arise, in these still others, and so on to infinity.³⁰⁹

Although some boundaries are set by the species, then, direction of formation an individual can differentiate itself in more and more subtle ways internal to this species’ possibilities. The generic proportion of force preformed in an individual could be understood then as a collection of possibilities that are not yet directed in a determinate way. Even acknowledging the role of the environment in the development of any particular organism, the question nonetheless remains – what exactly is determined by the genus? How determinate is this genus? Is dynamic preformation simply preformation of one form, with the addition ‘dynamic’ simply referring to the contingency arising from interaction with the

³⁰⁷ They are also not simply impressed mechanically: Schelling adds that this ‘superficial explanation’ is ‘banished from a foundational science of nature’, (that taxonomic “differences in beings of the same kind were impressed on them solely through external nature, or even by art, while it is proven that in the organisation of the species the disposition for such a characteristic constitution is originally laid already, and has only to wait for the developing influence of external causes”). See FO, p.45.

³⁰⁸ FO, p.47.

³⁰⁹ FO, p.44 n.

environment in the production of the individual and its epigenetic growth? What I have described so far suggests that it is possible to read Schelling as allowing for some indeterminacy to the genus, or at least various possibilities contained therein.

The Individual-Species Relation: Identity and Priority

There is an important further claim Schelling makes about species – that it is constituted by the individuals which make it up. This claim is both crucial to my view that Schelling embraces an account of species adequate to his project of philosophy of nature, and that complicates the more top-down view of species I have so far been emphasising; this section will provide an account of that claim. Scholars such as Richards have highlighted it, but I suggest such readings do not go far enough.

The complication arises from an apparent tension it introduces. It seems on the one hand that, given Schelling’s commitment to “generic preformation”, being part of the species (or the offspring of a member) to some degree determines how the individual will develop (the incorporation of contingency in development is thereby partly limited). In this sense, it seems clear that the species is logically prior to individual development – an entity that guides the formation of organism from within, which is then individualised via environmental influences. On the other hand, however, in the section on ‘Individuation and Stages of Development’, Schelling puts forward the potentially more ambiguous idea that the species is constituted by various different individuals. There, Schelling claims that:

the joint entity that no single individual completely expresses, but all together express, is called the species³¹⁰

That the individual does not *completely* express the species it is a member of is not to say that it doesn’t express the species at all but rather that a species is not something that can be exhaustively captured by any particular individual. Here, because species is described as a joint entity (a collective being), it is constituted by the totality of all the individuals that make it up. So the individual could be considered to have a constitutive role in the species in this account.

Richards describes Schelling’s idea of species here as an “inclusive”³¹¹ species concept along the lines of Herder’s and reminiscent of the contemporary accounts of Ghiselin and Hull:

³¹⁰ FO, p. 43; SW, “Das Gemeinschaftliche nun, das kein *einzelnes* Individuum ganz, aber doch *alle zusammen* ausdrücken, heist die *Gattung*.”

he [Schelling] construed the logic relating characters of the individual to those of the class as inclusive, or as parts to the whole that comprised them, a logic rather different from the reductive approach that Linnaeus took [...] one might think inclusively of individuals of several varieties as members of the same species if each realized a different aspect of the ideal for that species – no one individual would fully express the species; only the aggregate of individuals would embody the ideal.³¹²

There is some ambiguity to this phrasing: whilst I agree that a part-whole relationship appears to be at stake here for Schelling, I think that realisation of ‘a different aspect of the ideal’ of the species reads Schelling’s conception in a certain direction – that of an a priori ideal (here, a species concept) that is then played out or expressed in various individuals, each expressing some aspect. But, we could also read this statement, as I’ve suggested above, taking seriously the *constitutive* character of the ‘expression’ mentioned. This would mean stressing the contribution of the individual in the formation of the species – a different kind of part/whole relation. Although Schelling does not give much in the way of detail about how this is meant to work, he seems to be suggesting here that the species is something arising *posterior to* and *out of* the individuals themselves. In addition, if nature is indeed infinite activity, it is in “infinite development”, then it is never complete; new, somewhat different individuals may still arise within the species. Consequently, species are always provisional. Each new instantiation would, via its actualisation, retrospectively modify the species itself. If this were the case, it would not only be that Schelling rejects preformation as of an individual in shape in favour of a preformation of proportion of forces that fit a specific stage of nature’s development, but further that the *eidos* would itself be somehow dynamic.

On the other hand, this idea could seem to introduce a tension: how can a genus simultaneously inform and be informed by the individual? Given my account in the previous sections of the particular articulation of ‘preformation’ Schelling proposes – one of a proportion that makes possible certain phenomena – he stresses the role of accidental conditions in shaping the development of the individual. He notes that “nature produces something whose production could not be calculated because it depends on an accidental condition – something that also could not be preformed”. Stressing epigenesis, or “dynamic preformation”, if these accidental conditions play a role in the development of an individual, and in turn, the species is something that all individuals together express, it seems that

³¹¹ Which he opposes to ‘reductive’ (the presence of certain traits constitutes species membership) and ‘perfective’ concepts (only the most developed varieties completely express the species)

³¹² *The Romantic Conception of Life*, p. 302

there is a difficulty in presenting Schelling's account of species as completely *priori* to individual or individual as prior to species.

I would like to suggest that this difficulty is not an accident or an unanticipated logical problem encountered by Schelling's account. Rather, I think that this ambiguity of priority is constitutive of Schelling's understanding of nature.

Raimonda Modiano suggests that

Schelling shows the evolution of intelligence from nature, i.e. of a higher power from a lower one, while at the same time he follows "the method of descent, or emanation," demonstrating that the higher order is prior to and the causative ground of the lower.³¹³

Further, I think that this is a consequence of the very project of philosophy of nature, which, as I have outlined, aims to treat nature as both productive activity and as product. As we saw in Chapter 5, Schelling's Spinozism of physics – however it ultimately should be construed – recognises nature both as productive and as product; the same should be said of his conception of species.

The Course of Nature and Rejection of Monogenesis of All Life

Like Kielmeyer, Schelling is concerned with models for thinking about both the composition *and* the course of nature. In fact, in *On the World Soul*, he even uses the same phrasing as Kielmeyer [*Gang und Bestand*] to introduce his subject matter:

consideration of the universal metamorphoses of nature as well as the state and progress of the organic world certainly conducts the natural scientist to a common principle in which, fluctuating between inorganic and organic nature, is contained the first cause of all change in the former and the final ground of all activity in the latter...³¹⁴

³¹³ Raimonda Modiano describes this as one of Coleridge's criticisms of Schelling, see Raimonda Modiano, *Coleridge and the Concept of Nature*, (1985, Palgrave Macmillan) p.169.

³¹⁴ Schelling, *On the World Soul*, trans. Iain Hamilton Grant, in *Collapse* v.6 (Urbanomic, 2010), p.89.

However, it is immediately clear from this statement that unlike Kielmeyer, Schelling openly investigates the course and contents of the world within the concern with first causes and final grounds,³¹⁵ topics which Kielmeyer is far more reticent about. To return to Schelling's references to Kielmeyer, which I discussed in chapter 4, I mentioned that whilst Schelling favoured what he saw as Kielmeyer's comparative physiology – “that in the series of organisms, sensibility is displaced by irritability, and as Blumenbach and Sömmering have proven, by the force of reproduction”³¹⁶ – he criticised the lack of mechanism (how) and ground (cause) to explain the relations between the proportions of force in different organic groupings.³¹⁷ For Kielmeyer, there is a sense in which the graded or comparative series does not itself appear as something we need to focus on investigating the foundation of. Rather, this series is posited in order to be able to explain something else, namely, the ‘course and persistence’ of the organic world, and, in one version³¹⁸ of the speech, of the species that make it up. I tried to suggest in the previous chapter that Kielmeyer's openness of phrasing, combined with this emphasis on relations of forces as primary, allows for his system to be read as placing less emphasis on individual substances as foundational. And whilst Schelling also explains “apparent products” as resulting from oppositional forces, this is also coupled with an explicit commitment to a final causality, a sense that something of the result was contained in the origin, such that we can understand what we experience in terms of a deduction from first principles.

In *On the World Soul*, Schelling speculates about the possibility of transformations in nature, including transformations of organisms from one kind to another. This arises in the context of his assertion of a naturalist explanation of nature, and hope to avoid the introduction of vital or supernatural principles. It would be easier to provide a naturalistic explanation of everything in nature, including organisms, Schelling claims, if we were “able to show that the graduated series of every organic being is formed from a gradual evolution of one and the same organisation”.³¹⁹ Because he is keen to explain everything from the first principle of nature, (first cause and final ground), if he can show the development of various natural phenomena from this one initial common principle of nature then he can avoid the introduction of supernatural principles or the introduction of extraneous vital principles in his exposition. In case someone points at a lack of empirical proof of such transformation to assert the impossibility of evolving everything in nature from a first principle, Schelling asserts that a lack of experiences of species transformation in nature does not sufficiently prove that it is not the case that this could have taken place (we can use analogical reasoning to think about this). The time periods over

³¹⁵ which he must do because he considers the world using an organic model (and derives mechanism from organism).

³¹⁶ FO, p.141

³¹⁷ he writes that “neither the mechanism nor ground of this graduated series has been discovered up to now” FO, p.141.

³¹⁸ The manuscript included with the *Gesammelte Schriften* edition explicitly mentions species.

³¹⁹ FO, p.90-91.

which transformations in organic nature could have happened could be so large that it would be understandable or even impossible for it to have been recorded in human experience.

That our experience has known no reorganization of nature, no transition of one form or type into the other (although the metamorphoses of many insects and, if every bud is a new individual, also the metamorphoses of plants could at least be adduced as analogical phenomena) is no proof against this possibility; for, were a defendant to answer it, the changes to which organic as much as anorganic [anorgische] nature is subjected, could (until a universal stagnation of the organic world comes about), have happened over ever longer periods, for which our small periods (which are determined by the cycles of the earth round the sun) provide no measure, and are so large that until now there has been no experience of the course of a single one. Fine.³²⁰

and then,

Let us abandon these possibilities and see what then is true and what is false in the antithesis between mechanism and organism, so as to determine with as much certainty as possible the limits within which our understanding of nature must remain³²¹

What is clear here is that 1) he does not at this point claim that it is impossible that there would be this sort of transition in nature, and 2) points out that merely a lack of empirical proof does not of itself disprove the possibility. But this issue is not really itself the focus of his discussion here. It is part of an investigation into the relation between mechanism and organism – a topic that Schelling redirects back to at the end of the paragraph. To me this is a claim about the difficulty of relying *only* on empirical evidence to prove or disprove certain things, without an accompanying explanation that derives the necessity of the thing a priori. So this need not be necessarily read as a potential endorsement of species transformations.

In FO, Schelling commented further on the issue of changes in the organic world, rejecting the idea that all organisms spring from one original organism:

the hope [...] to present the origin of all organisms as successive, and indeed as the gradual development of one and the same original organism—disappears from our point of view, for the

³²⁰ FO, p.90-91.

³²¹ FO, p.90-91

universal product could not be inhibited at various stages without at the same time dividing itself into opposite sexes. As soon as there are opposed sexes it only reproduces itself to infinity...³²²

Richards claims that these two passages from Schelling's works do not present contradictory accounts. It seems to me that the passages are about different things, and that they are actually not very closely related. The second passage rejects the historical transformation of all the different species forms out of *one* original organism, whereas the *Weltseele* passage only proposes the impossibility of ruling out metamorphoses *within* species. But while I agree with Richards that the passages do not necessarily conflict, and also that Schelling here is rejecting "genealogical theories"³²³ of the origin of the variety of species, I do not agree that the *FO* passage is "a further specification and not a rejection of the idea that in nature morphological transitions have occurred, and that over time new species have appeared on the earth".³²⁴ This is because I think that Schelling gives very clear boundaries of what he thinks count as species, boundaries that would make it possible for him to countenance metamorphoses or to variation, but not transform into new *species*.

If the different species of organism are not historically all traceable as branching from one initial species, what is shared by the various organisms in nature? Schelling claims that organisms have a shared physical origin, in that they are all together one product. In a note, Schelling qualifies this view when he says that although the *physical* origin of all organisms are "stages of development of one and the same organism", that "what holds for diverse organisms in terms of a physical origin, cannot hold good when transferred to the historical origin".³²⁵ I see this claim, again, as a restatement of Schelling's commitments to naturalism: all the various activities (and organisms) of nature are seen as resulting from the same infinite natural activity, as well as being unable to claim that they share a historical origin due to the roles he thinks sex plays, as I have outlined above: instead of supposing that different species have branched from a shared historical origin in one species, Schelling thinks that for each different species nature made a separate product, because sex fixes each transformation in his account.³²⁶

Elsewhere, Schelling characterises the idea that all organisms are aspects of one product as a rational idea about the shared origin of all products as expressing the absolute:

³²² FO, p. 49.

³²³ See Richards, *The Romantic Conception of Life*. P.301.

³²⁴ Richards argues that reading Erasmus Darwin was decisive in Schelling's move. Richard's conviction that Schelling proposes "real historical metamorphosis, a temporal development and alteration" opposes Engelhardt's rejection of the idea that Schelling proposed organic descent. See Dietrich von Engelhardt's account in 'Schellings philosophische Grundlegung der Medizin', in Sandkuhler, p.212. I agree with Richards that Schelling does not reject that nature has a history but disagree with his claim that Schelling described historical species evolution.

³²⁵ Note FO p.49

³²⁶ Schelling: "In order to bring forth a new product, nature would have to begin again from the start." FO, p. 49.

the assumption that different organisms have really formed themselves from one another through gradual development is a misunderstanding of an idea which actually does lie in reason. Namely, all individual organisms should together amount to one product. this would be thinkable only if nature had had one and the same archetype for all of them³²⁷

Thus far this sketch has shown that Schelling situates his discussion of species in the context of the derivation of products or phenomena from the claim that nature is infinite activity. But regarding why the phenomena appear as they do – or what Schelling asserts that the first and final cause of nature’s activity is, is the realisation of a certain ideal or archetype.

But the ideal is something nature realises *in toto*, not in any particular limited part of nature’s activity.

that nature expresses such an absolute original through all organisms together could only be proven if it is shown that all diversity of organisms is only a difference of approximation to that absolute, which would then be the same for experience, as if they were originally only various developments of one and the same organism [...] this archetype would be the absolute, that without internal difference in kind, in which individual and species coincide, which is now neither individual nor genus, but both at once. This absolute organism could not be presented through an individual product, but only through an infinity of individual products which, seen singly depart infinitely from the idea, but taken in the whole are congruent with it...³²⁸

A second point that I think this analysis brings to light is regarding the role played by differentiation. Whenever an aspect of a stage of nature – a species – is realised, it can be seen to realise or constitute that species, and accordingly (because it is part of it) the absolute. This could suggest a value being placed, in Schelling, in the differences between both different species, and between varieties and members of a species. Because Schelling claims that only an infinity of products, taken together, could express the idea or the absolute organism, each different individual product is a necessary part of that expression. This is quite different, as I will suggest in the following chapters, to Hegel’s approach, when he discusses individuals relative distance from properly expressing the species as a privation.

Summary

³²⁷ FO, p.49.

³²⁸ FO, p.50.

My examination of Schelling has suggested that for Schelling a species members have a clear shared identity in that they are held to express a particular proportion of 'actants'. In expressing a proportion of actants, all instantiations of a given species represent a stage of the absolute. Species is therefore given an intermediary position between individual apparent 'products' or organisms and the absolute. Species therefore at the same time constrain the way the absolute is expressed but in so doing are what allow it to manifest at all.

This examination has also shown that for Schelling the role of species at the level of the individual organism, is manifest in various organic activities.

Schelling's account proposes a clear metaphysical boundary between species difference and variety that fixed by the presence of sexual difference in a kind. Because of these commitments Schelling is wary of species transformation.

Finally, I suggest that the tension between productivity and product at the heart of Schelling's philosophy of nature is reflected in the way that Schelling articulates the identity relation between individual and species in the *First Outline* – in which individuals express parts of a whole. The productivity-product relation involved in considering nature as a whole can be seen when contemplating the relation between species and individual.

Further, his understanding of the species-individual relation on a part-whole model can also be seen to give a more constitutive value to the differences of individuals.

PART III: HEGEL



Fig 7.

Agnus scythicus. [...] It produces a plant that is about three feet high, and which is called barometz, or lamb, because it looks exactly like that animal – it has the same legs, hooves, ears and head. All that is missing are its small horns, in place of which the plant has a tuft of woolly hair. *Agnus scythicus* is covered with a thin skin that the local inhabitants use to make bonnets. It is said that its pulp is like the flesh of a crayfish; that when it is cut, blood flows from it; and that it has a very sweet taste. The plant's roots spread a long way under ground. What is even more extraordinary is that *agnus scythicus* eats the shrubs that grow around it, so that if ever these plants are uprooted or die, then it too will die. This is not in the least a matter of chance: every time the plant has been deprived of nourishment from neighbouring plants, it has perished. A further incredible fact is that wolves are the only carnivorous animals that are fond of it' [...].

Could it be possible that after so many important authorities have vouched for the Scythian lamb's existence, that after Scaliger's detailed description, which included everything except how its feet were produced, could it be that the Scythian lamb should turn out to be a fable? And if this is the case, what else can be believed in natural history?

Kempfer, who was well informed in both natural history and in medicine, made great efforts to get hold of one of these lambs in the regions of Tartary, but without success. 'Neither the common people nor the botanists here,' says the author, 'have ever seen a grass-eating zoophyte; and all I have got out of my search is a feeling of shame for having been so credulous'. He adds that the fairy tale, which fooled him as it did so many others, originates in the use made in Tartary of the skins of certain lambs, which are killed before their birth, along with their mothers, for the fineness of their wool. The lambs' skin is used to trim coats, dresses and turbans. Travellers, who were either mistaken about the nature of this skin due to ignorance of the local language, or for some other reason, have managed in turn to mislead their fellow-countrymen into believing that the skin of an animal was in fact the skin of a plant [...].

Here then is all the wonder of the Scythian lamb reduced to nothing, or at least to very little, to a hairy root which people twist and turn to make it look a little like a lamb.

- Denis Diderot.³²⁹

³²⁹ Diderot, Denis. "Agnus scythicus." *The Encyclopedia of Diderot & d'Alembert Collaborative Translation Project*. Translated by Malcolm Eden. Ann Arbor: Michigan Publishing, University of Michigan Library, 2003. <http://hdl.handle.net/2027/spo.did2222.0000.230>. Originally published as "Agnus scythicus," *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, 1:179–180 (Paris, 1751). Referenced on https://jhiblog.org/2021/12/22/the-vegetable-lamb-of-tartary-renaissance-philosophy-magic-and-botany/?fbclid=IwAR02IA-2BMhfq5eKNhb2GJY3cIFkMD1rbIpRBujualgC3er2m4npXe96_E

In the following two chapters, I will show that the concept of species or genus [*die Gattung*] is crucial to understanding Hegel's Jena work. In this respect, he is not unlike Schelling or Kierkegaard. But for Hegel it is more prominent and is mobilised in more apparently diverse contexts: *Gattung* plays an important role not only in the organics of his *Encyclopaedia* sketches, but also in his metaphysical writings. This suggests that his connection of 'the idea' to '*Gattung*' is significant; it is not just a matter of applying the logic of the 'idea' to his discussion of species, but understanding Hegel's view of species contributes to understanding his philosophy more generally. Equally, both the debates of the time surrounding species and his understanding of the peculiar space carved out by *Naturphilosophie* go on to motivate his critiques of various ideals of scientific practise in the *Phenomenology*. Finally, examination of this concept in Hegel's Jena work brings differences between his earlier and later thought to light.

Given its importance, I will make the following claims about species in Hegel's Jena work:

Hegel's discussions of species in his Jena period can seem unsatisfying in that they do not give criteria for species membership or even give a straightforward indication of the scope of his notion of species – instead his treatment focuses on the roles played by species. The species concept plays a pivotal role in Hegel's explanation of organic processes in particular. It is not only operational in Hegel's discussion of reproduction, as might be expected, but also in his explanations of death, sickness, and the relations of recognition between animals, which suggests that he thinks of the individual's '*Gattung*' as the ground of these various organic activities.

Hegel's claim that the organic is comprised of two sets of processes: individual-species and species-individual, expands the understanding of 'organic' beyond the focus the reception of Kant's analysis of teleological judgement, which was usually applied to the part-whole relations in an individual. Hegel explicitly connects what is involved in 'the organic' to relations between individual and species, and thus considers the individual as organic within a wider network of relations and processes.³³⁰

Further, he uses the relation of species and individual to give an ontological grounding for the differences in the kingdoms of nature – at least, between plants and animals.

³³⁰ This expansion of the sense of 'organic' accompanies the growing independence of biology as a discipline and the expansion of objects/phenomena of study.

Although he provides an ontological basis for the plant-animal distinction, more broadly, Hegel is not concerned with establishing any fine-grained taxonomies in the Jena lectures on nature: Hegel doesn't explicitly address taxonomy or evoke his own taxonomic project. In the *Phenomenology of Spirit*, he goes on to advance a critique of various taxonomic practices and taxonomic principles.

Gattung is associated with the idea, one of the most important concepts in his philosophy. Not only does it suggest that the way we learn about the idea is through observing natural phenomena, and that Hegel thinks that the organic is the condition of the idea, but further, I will suggest that unpacking Hegel's claim that species is "the existent idea" lends evidence to the proposal that Hegel's way of thinking about 'the idea' is derived from an organic model – that of *Gattung*.

In exploring these issues, these chapters also lay groundwork for chapter 8, where the issue of *Naturphilosophie* as a methodology is addressed. Hegel's lack of concern for presenting taxonomy in his lectures on philosophy of nature also suggests a peculiar project or conceptual space for philosophy of nature. This project is why Hegel's discussion focuses on processes and the proximity of *Gattung* to 'the idea'.

7: THE ROLE OF SPECIES IN THE JENA PHILOSOPHY OF NATURE

This chapter examines the roles played by the concept of species [*die Gattung*] in Hegel's Jena *Naturphilosophie*, focusing on the two sets of lecture notes from 1803/4 and 1804/5.

The chapter is divided into three sections. The first part (7.1) addresses the role Hegel assigns to 'Gattung' in his general discussions of the organic, where it is cast as the 'existent idea'. My analysis shows that for Hegel, the concept of *Gattung* is primarily reserved for intelligible organic kinds, and is inextricably connected to processes of generation, unlike categories or natural kinds more generally. For Hegel, his concern with *Gattung* is not taxonomic, and instead focuses on the traditional philosophical questions of essence and intelligibility, but with a specifically organic framework.

The second part of the chapter (7.2), discusses the various *processes* that the species concept plays a role in. Several roles are played by the concept of species here. Most apparent is his elaboration of the 'Gattungsprozess', which involves not only reproduction but also illness and death. More surprising is that the concept is also operational in Hegel's understanding of instinct, sensation, and moreover, the transition from nature to spirit in his narrative, due to the anticipation of recognition that can be seen in the species process. In this way, Hegel expands the sense of 'the organic' to involve intersubjective processes (relations to other individuals) that are beyond the analysis of an individual's internal constitution.

In the final part of the chapter (7.3), I show that the species concept facilitates Hegel's explanation of the difference between plant and animal kinds in general, that is, between plant and animal kingdoms. By focusing on this aspect of Hegel's use of the species concept, I also show that in his philosophy of nature Hegel departs from the prevailing explanation from the Aristotelian tradition for distinguishing plant and animal realms. In doing so, Hegel introduces a new conceptual scheme for thinking about the differences between kingdoms that makes use of his conception of species.

This examination will also be used to show that Hegel's discussion gives the differences between plants and animals an ontological basis such that they are distinguished in kind – rather than merely by degree, and so Hegel's construction of the plant/animal distinction is relevant to debates about Hegel's realism³³¹ with regard to natural categories more generally. Finally, consideration of the plant/animal

³³¹ Regarding 'realism' in interpreting Hegel's philosophy of nature, debates between those who read Hegel as a conceptual realist, such as Kreines (2008), on the one hand, and those who read him as a naturalist, e.g. Pinkard (2012), have been at issue in the literature. For more on this debate see e.g. Paul Redding, 'Actualist versus Naturalist and Conceptual Realist Interpretations of Hegel's Metaphysics', *Hegel Bulletin* 42, *Special Issue 1: Naturalism and Sociality*, (2020): 91-38.

distinction provides an opening to discuss Hegel's model of the species-individual relation, which I suggest should not be considered as a simple part-whole relation.³³²

7.1. SPECIES AS EXISTENT IDEA

In his 1803/4 lectures, Hegel identifies his key theoretical concept, 'the idea', with species [*Gattung*]. Why this is significant, and how they are identified, is the subject of this section.

My analysis will show that for Hegel, the concept of *Gattung* is primarily reserved for organic kinds, and is inextricably connected to processes of generation, unlike categories or natural kinds more generally. For Hegel, his concern with *Gattung* is not taxonomic, and instead focuses on the traditional philosophical questions of essence and intelligibility, but (1) within a specifically organic frame. I will also show that in Hegel's account, the notion of species (2) proves important epistemologically in that it helps us understand the structure of the idea as self-related process rather than inert object. But the proximity of these two notions also suggests that, in Hegel's view species is primary in the temporal order for how we can come to learn about the idea.

Organics as the site of Species

In Hegel's 1803-1804 lectures, the notion of '*Gattung*' has its most frequent and important deployment and development in the fragments on nature. As in Hegel's other works dealing with nature, the fragments proceed more or less in series from discussion of what is now considered physics (gravitational motion, light), to chemistry, to geology, then to discussion of plant, and finally, animal organisms.³³³ The concept of species [*Gattung*] starts to play a role in the discussion at the point where the aspects of nature discussed pass over into 'the organic'. In the nature fragments from 1803/4,

³³² A note on methodological differences in the discussion of species between Schelling and Hegel here; see also the relevant sections of scholarship discussion and the discussion of *Naturphilosophie*. In the Schelling texts I focus on, the discussions of species occur, as I've tried to argue, in line with Schelling's focus on providing both an explanation of nature as *naturans* and as *naturata*, and so species is treated 1) as a question of productive activity that is never a complete object and 2) thinking about the collection of individual productions. For Hegel, by contrast, my exegesis shows his concern with describing the cyclical activities and interactions of species with individual organisms. More broadly, Hegel's strict conceptual separation between metaphysical and natural forms of account, which develops into separate mirroring treatments of topics in his later work, are not the same as Schelling, where the philosophy of nature should be able to provide a standalone account.

³³³ This general trajectory is found in these earlier works as well as his later 1817 *Encyclopedia*. However, for Hegel, 'physics' can include the discussion of organic phenomena. For example, in these 1803/4 fragments, 'physics' is a new stage to be entered to think about the earth, rather than the mechanics of earlier stages.

Hegel uses the concept of species to discuss the organic “in general”,³³⁴ in discussion of plants, and in discussion of animals. In all three contexts then it appears to be bound up with the organic, as general idea and as the organic’s two ‘modes of existence’. For these reasons, I think that Knappik’s claim regarding Hegel’s later *Science of Logic* – that “the notion of a ‘natural kind’ provides an apt rendering of Hegel’s term ‘genus’.”³³⁵ – does not capture the specificity of the notion – at least as it is used here in Hegel’s Jena work.³³⁶ I will develop an account of the specificity of ‘species’ to the organic in this section.

Because it always appears in connection with the organic, we can already see that Hegel uses the concept of species in such a way as to set it apart from more general consideration of logical categories. In this he gives the concept of species a distinctively ‘organic’ character. But what it means to explicitly connect species with ‘the organic’, and how exactly they are connected, requires a brief discussion of Hegel’s use of the term.

In the 1803/4 notes, Hegel’s characterisation of the organic as a distinct realm consists in that it “has taken soul for itself”.³³⁷ He writes that “what was previously our reflection – that the moments of totality are essentially a relation in infinity, oneness – this exists in the organic”.³³⁸

Hegel explains organisms (organic entities) via a particular interrelation of whole and parts. To this extent he does not depart from Schelling and Kierkegaard.³³⁹ But here, the interrelation of the moments or parts is developed in terms of ‘a relation in infinity’, which I take to indicate a relation that is infinite in the sense of turned inwards, cyclical, and so creates a self-relation (rather than to mean a relation of moments in infinity where infinity is thought as infinite extension).³⁴⁰ This is why Hegel restates the relation in infinity as ‘oneness’; an entity is created in these processes.

³³⁴ ‘As a general idea’.

³³⁵ Knappik claims that there are three reasons why natural kinds and *Gattungen* can be aligned; first, because they are not artificial or merely subjective, but are a “matter of objective fact”, second, because the term ‘natural kind’ is not restricted to substances but can include e.g. properties, processes, and third, because belief in natural kinds in metaphysics is generally paired with realism about them, and with essentialism. See Knappik, ‘Hegel’s Essentialism’, pp. 763-4.

³³⁶ A further noteworthy difference is that where Knappik indicates *Gattung* is equivalent to the objective concept in Hegel’s later work, in the material we are looking at it is the existent idea; Hegel’s later logical terminology had not been fully developed by this point.

³³⁷ JSI p.125

³³⁸ JSI p.125

³³⁹ Kierkegaard and Schelling, as we have seen, also formulate part-whole discussions that are articulated in contradistinction to the outside. As Rachel Zuckert notes, Schelling (and Hegel) depart from Kant’s analysis of teleology in nature in that they consider ‘natural purposes’ in relation to their environments, rather than merely individually. But how this relation is articulated is quite different. See Rachel Zuckert, ‘Organism and System in German Idealism’. *Cambridge Companion to German Idealism* (2017). pp.271-291.

³⁴⁰ Hegel may have in mind a contrast with the kind of ‘immortality’ that can be attained through a species reproducing.

He also adds an ontological point here – that this relation in infinity of the moments of a totality is found in the very existence of the organic. In his previous discussions in the lectures of the interrelation of various mechanical or chemical aspects of the world, the ‘relation in infinity’ was an aspect of the state of affairs contributed by the observer (Hegel, or his audience). That was a ‘reflection’ (presumably to indicate a reflecting, not determining judgement, which we are free to apply or not apply to the phenomena). Hegel’s consideration of plants and animals as organic is not conceived of as an external reflection on phenomena viewed *as if* they were organic.³⁴¹ Instead, plants and animals really are organic, because they are genuinely self-related. Whereas Kierkegaard seemed at least ambivalent about the precise way in which purposiveness is to be thought in the organic world, Hegel situates himself explicitly here as not following the well known and much discussed Kantian proviso of teleological judgements set out in the introductory chapter. This self-related existence is created by, and manifest through, their activities: the functioning of various organic systems (or processes) that he outlines.³⁴²

What is organic, then, has soul, which is to say that its moments are infinitely related to itself – and that this type of relation really exists in nature. ‘Species’ is always found in this organic context, so the initial point of departure understanding it should be in the context of a special type of self-relation that is produced by organisms.

Species as the Idea of an Organic Individual

Bearing in mind this organic context, in his Jena system lecture notes, Hegel claims that for an organic individual, its ‘idea’ is the species [*die Gattung*] ‘or universality’:

the idea of organic individuality is species, universality; it is infinitely an other, and in this being-other to itself, exists in the separation of the sexes, of which each is the whole idea, but that relates to itself as to an externality, views itself in otherness as itself and sublates this opposition.³⁴³

³⁴¹ Following attempts to read Hegel as working within the framework of Kantian philosophy, found, e.g., in Pippin and Henrich (the so-called ‘non-metaphysical’ readings of Hegel), other scholars see Hegel as making teleological claims about organism as “objectively valid”, e.g. James Kreines “The Logic of Life: Hegel’s Philosophical Defense of Teleological Explanation of Living Beings,” in: Frederick C. Beiser (ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy*, Cambridge: Cambridge University Press 2008, pp. 344–377.

³⁴² We will look at how the processes unify and organise what is disparate and relate to the species of the individual in 7.3.

³⁴³ JS1 frag 10 p126. “...der Idee der Organischen Individualität ist Gattung; Allgemeinheit; sie ist sich unendlich ein anderes und in diesem Andersein sie selbst, existiert in der Trennung der Geschlechter, deren jedes die ganze Idee ist, aber die, sich auf sich selbst als auf ein Aeusseres beziehend, sich im Anderssein als sich selbst anschaut und diesen Gegensatz aufhebend.”

Because the idea is a pivotal concept in Hegel's thinking throughout his philosophical career, and *Gattung* is given an important philosophical role in Hegel's connection to this concept, this is worth dwelling on before analysing this quotation. What is noteworthy about Hegel's concept of idea? As with Kant, in Hegel the scope of idea is narrower than a Cartesian or Lockean conception in that it does not describe any perception present to mind, and is also associated with reason rather than understanding.³⁴⁴ But I think, unlike with Kant, it is also better understood without the necessary connection to mind or mental activity, and, as I will argue throughout these Hegel sections, indicates a unifying structure or process. The looming philosophical context could also be taken to be Plato's theory of forms (*Die Idee* is derived from 'eidos') insofar as it not only indicates a rational aspect of reality, but also – put very roughly – has a role in the unification of phenomena which may be disparate through their participation in it.³⁴⁵ However, the idea is not simply to be understood as a universal or as natural kind. Rather than overly anticipate, it is better to look at the use he makes of the concept here in order to see what Hegel means in this context.

Dialectic of the Idea and the Dialectic of the Individual

Hegel's discussions of the species often shift focus from the stages of whatever process he is explaining from the perspective of some or other organic individual, to discussions of the species itself and its process. These two perspectives (and their corresponding processes) are interdependent. In addition, there can be no explanation of the species without reference to organic individuals, and there is no explanation of the individual without reference to the role of the species. This signals a more Aristotelian than Platonic outlook³⁴⁶ in that the species/idea is not able to be considered in isolation from individuals. The kind as such, as a universal, doesn't exist of itself in an immaterial, unchanging Platonic realm.³⁴⁷ For Hegel, the relation between individual and species can be considered from either perspective. First, regarding the idea itself, it is thought to be an absolute unity. But an absolute unity cannot exist in the world, so it exists only as 'being another to itself' in individuals:

³⁴⁴ This is different to what e.g. Beiser says about the Kant-Hegel relation re ideas, see Beiser, *The Struggle Against Subjectivism*, p. 132. It is worth noting the connections between reason (taking in the idea and contradictions) as opposed to the understanding; the latter would involve fixed taxonomies, whereas *Gattung* can be something that contains contradictory properties or unites differences because of the kind of universal that it is.

³⁴⁵ But as will become clear, Hegel's 'idea', as expressed in the Jena period, is unlike the traditional view of Plato's in several respects, especially in its post-Kantian context (where teleological judgement is emphasised) and consequent characterisation as that which is self-related.

³⁴⁶ The admiration Hegel had for Aristotle is outlined in e.g. Gilbert Gérard, 'Hegel, Reader of Aristotle's Metaphysics. Substance as Subject,' *Revue de métaphysique et de morale* Volume 74, Issue 2, 2012, pp. 195-223. See also the discussion of Aristotelian readings of Hegel in Ng, *Hegel's Conception of Life*, p.19.

³⁴⁷ I realise that this is not the only way to interpret Plato – I use this traditional interpretation merely to illuminate an aspect of Hegel's thought by contrast.

The idea itself is its absolute unity; the idea exists only as infinite, as being another to itself [*als sich selbst ein anderes seiend*], as individuality.³⁴⁸

If we considered the idea insofar as it exists, i.e. as species, we can only consider it as it appears in individuals. This quotation characterises the species as a kind of universal that is ‘infinitely an other’. The ‘being-other’ of the idea means that it is something that exists *only* as the different individuals of that kind. The existent idea is not therefore something with a simple, undifferentiated self-identity. Instead, the idea described in terms of the individuals that are its existence and expression. The infinity Hegel attributes to the species here refers, I think, to the cyclical characterisation of the process of the *Gattung* – the ongoing generation of new, different individuals that nonetheless belong to the kind.

On the other side, if we consider the individual, Hegel adds that

The individual is the idea, and it exists only as idea, hence the contradiction is in the individual, to be this idea and at the same time being only something other than the idea, it [the individual] is absolute drive; it [the individual] is only insofar as it is the sublation of the determinateness, is this being-other. [...] in the individual there is therefore the contradiction of being this idea and at the same time only being something other than this idea, it is an absolute drive; it is only because it is the sublation of this definiteness; is this otherness.³⁴⁹

Because the individual is in one respect the idea – it is one of its species – and at the same time, in another respect, something other than the idea – it is a particular individual that is not in an undifferentiated identity with the kind or idea – Hegel claims that it contains a contradiction. It is idea and yet is also not idea. The individual’s contradiction of being idea and not-idea has the result that the idea is expressed in the individual as ‘*absolute drive*’.

Hegel takes the individuals of the species to be divided into two sexes,³⁵⁰ and, as with the multiplicity of individuals of a kind, this is another way of being-other (whilst remaining itself) that the species is capable of. But Hegel privileges the (from his viewpoint) binary sex difference above other types of difference in the case of the *Gattung*: “in this otherness it [the idea] exists in the separation of the sexes, each of which is the whole idea”. The dialectic that this stark conception of sexual duality enables for Hegel³⁵¹ is articulated in the following stages:

³⁴⁸ JS1, p.126.

³⁴⁹ JS1, p.126.

³⁵⁰ From a contemporary standpoint this may be overly simple, as this not really my focus here I don’t wish to go too far into these debates.

³⁵¹ It is not clear to me that it is necessary for Hegel to have held this notion of sexual dimorphism to have the idea of the individual’s recognition of identity in another of the same species – i.e., why he couldn’t have at this level, the acknowledgement of identity despite numerical difference, for example. It seems that this move is necessary for his account because he ties the existence of the idea to the act of reproduction. He also claims that “each [sex] is the whole idea”. It seems that sexual dimorphism is the form of identity in otherness Hegel allows to be meaningful for the idea. This connection

1. the species contains sexual duality within it, composed of ‘positive universality’ (considered to be passive, and ‘female’) and ‘negative universality’ (considered to be active, and ‘male’).³⁵²
2. each sex ‘relates to itself as to an externality’: individuals form relations to an other of the same kind.
3. in identifying the other as of the same kind despite its difference of sex, the individual animal can relate to itself, its kind, in something external to itself.
4. the individual sees its ‘self’ – its species – as something different to itself (e.g. in the other sex),
5. then it cancels or sublates this opposition, by identifying themselves with the other as the same species.

For now I will leave aside the implications of Hegel’s choice to interpret animal interactions with each other – from the perspective of the individual – as mediated self-relations. Whilst Hegel presupposes that there is sexual dimorphism of individuals, he holds that, regardless of this sexual difference, each individual is wholly the kind of thing that it is. A female rat is not partially, but fully a rat, so too is a male rat. This means that membership in a species doesn’t entail a particular part-whole relation where each instance forms a fraction of a whole. It also suggests that, unlike Schelling’s discussion in *First Outline*, an individual species member cannot be redefined to include e.g. the three types of bee, or a male and female fly at once.³⁵³ The *Gattung* separates itself into sexes, but each sex is the whole idea, it’s unclear why this difference is more privileged than other differences.

An individual entering into a sexual act with an other of the same species requires, for Hegel, the identification of the other (in this case, of the other sex) as having a relation of identity with it. Moreover, this relation of identity is a “sublation of otherness”, where the differences are simultaneously negated and yet preserved. The result is that, in this contact, “only the idea exists”. The individuals lose their individuality in that moment, or, as he puts it, “the individuals who are only insofar as they are drives [*Trieb*], and relating idea to themselves as an other, cease to be”.³⁵⁴

The process of generation of a new individual, takes from ‘the opposites’ (i.e. the parent individuals) what is common to them both: their species.

provokes the question – how actualised does reproduction have to be for the existence of species, e.g. is the act required, in each case, of the generation of young?

³⁵² For Hegel here the “female” is associated with “the receiving of the form, but the male appears as the negative side of the centre, as the active part of the form.”

³⁵³ Lindquist claims, for example, that scholars on the science of logic predominantly view Hegel’s thoughts on this issue as following Aristophanes in Plato’s *Symposium*, e.g. that an individual is half of a whole being.

³⁵⁴ JS1, p.126.

what is generated is the existing idea, which for the same reason took its essence, to be idea, from what is opposed to it, and leaves only singularity [*Einzelheit*] and thereby only independence as form, not as essence, and makes them into elements, the child and these, which have become singularities or the independent elements – come apart from one another indifferently.³⁵⁵

This overview of the organic already indicates the claim that Hegel follows it with – that he considers ‘the organic’ proper to be comprised of two processes that “form a circle”.³⁵⁶ On the one side, the ‘idealisation’ of ‘independent elements’ which is at the same time the process of their self-preservation. Hegel also describes this as a movement of the individual around the species that is one in which it relates both to the idea and to inorganic nature: the elements outside the individual that it continually differentiates itself from.

On the other side of the cycle, the process of the genus is the continual self-production of the genus or the idea through the realisation of new individuals.³⁵⁷ The idea can be only as an individual that is related to it, or a mediated self-relation.

Hegel calls this cycle of individuals and genus returning to itself from otherness the “organic reflection” and a “doubled movement”.³⁵⁸ We are invited to think about this proposed duality of processes using the image of celestial bodies, where the idea (or species) is the sun around which the individual’s activity of self-maintenance moves. This image is worth quoting in full because it makes explicit the various relations at play in his understanding of the organic.

³⁵⁵ JS1, fr.10 p 126: “ In diesem Aufheben des Andersseins und der Berührung beider Geschlechter nun existiert also nur die Idee; die Individuen, die nur sind als dies, daß sie Triebe sind, Idee und sich auf sich selbst als ein anderes beziehend, hören auf zu sein; das Erzeugte ist die existierende Idee, welche ebendarum denen ihr Ge g e n ü b e r s t e h e n d e n ihr Wesen, Idee zu sein, genommen hat und nur die Einzelheit und damit nur die Selbständigkeit als Form, nicht als Wesen läßt und sie zu Elementen macht, das Ki nd und diese zu Einzelheiten gewordenen oder die selbständigen Elemente fallen indifferent auseinander.

Aber die Idee ist wesentlich nur als Unend l i c h k e i t in sich selbst als sich auf anderes be- 30 ziehend, und in ihrer Existenz ist sie unendliche Individualität; es fängt unmittelbar ihre Spannung gegen die Elemente an, und der ganze Kreislauf ist absolut in sich zurückgekehrt; oder er hat keinen Anfang und kein Ende und ist derselbe ewige Kreislauf..“

³⁵⁶ JS1, p. 126 f.: “der eine ist der Kreislauf, in welchem die selbständigen Elemente zu idealen und aus diesen ebenso absolut zu selbständigen werden, indem ihre Idealität, negative Allgemeinheit, unmittelbar auch positive Allgemeinheit ist, der Kreislauf der Selbsterhaltung, des Gesetzseins des elementaren Prozesses in dem Organischen, der andere der Kreislauf der Gattung, die realisierte Idee. Das Organische, das so die Differenz nach außen gegen den Prozeß der Elemente aufgehoben hat, indem es ihn in sich setzt, setzt sie in sich selbst, zerfällt in sich in differente organische Individuen, wird zum Geschlechte und hebt ebenso diese Differenz auf und kehrt zur ersten zurück. Das Organische schaut sein Anderssein, sich dort als die Totalität des unorganischen Prozesses an, unbewußt , daß es dieselbe Totalität ist; dieses Anderssein wird ihm dazu, daß dies andre es selbst wird oder daß sein Anderssein dasselbe organische Wesen ist, und diese Differenz verkehrt sich wieder in die erste. Beide greifen unmittelbar ineinander. Das Aufgehobenwerden der Differenz gegen den unorganischen Prozeß wird eine Differenz der Geschlechter und das Aufgehobenwerden dieser jene erste Differenz.”

³⁵⁷ Hegel expresses this continual production of individuals as a cycle, where “the whole cycle is returned to itself absolutely; or it has no beginning and no end and is the same eternal cycle”.

³⁵⁸ JS1, p. 126.

the idea, the genus, is the sun of the individual, around which the movement of self-preservation of the individual rotates; and this motion of the individual around the species is one the one side related to the idea, and on the other, to inorganic nature. It is the middle; the infinity of externality is according to two sides outside itself; it is the earth, that moves around the sun, equally moves a moon around itself, and in its being holds sun and moon apart from it – but so that it has its active power against the moon only from the sun. Thus the organic preserves itself, and moves itself around its axis for itself, is in itself, against the power of the species, which makes it perish, as well as preserving itself against inorganic nature.³⁵⁹

The self-preservation of the individual, then, is always within the sphere of influence of the species.

These two movements form a cycle that is “absolutely unable to be differentiated”³⁶⁰ – although presumably, as Hegel has outlined them, we can think about them relatively independently.

The image Hegel offers here alludes to the key point. Whilst an individual only has the power to preserve itself against inorganic nature as a result of the idea – that is as a result of its species (that is to say, an animal distinguishes itself from inorganic nature precisely because it is a certain kind of animal), equally the individual holds the species apart from itself. This is a power Hegel does not say the individual gets from the genus; the individual has powers of its own. To take up an aspect of Hegel's image which he does not emphasise here: the Earth exerts a gravitational force on the Sun just as much as vice versa – it is just that the effects of the Sun on the Earth are more easily detected than the comparatively smaller effects of the Earth. Individuals too are not simply determined by their species, but (in a comparatively smaller way) determine the species too. We will now turn to look at how both of these directions of influence take place in terms of the more concrete processes Hegel outlines in the next section.

7.2: SPECIES AND ORGANIC PROCESSES

This section examines in more detail the various roles Hegel assigns to *Gattungen* in plant and animal life. Most apparent is his elaboration of the ‘*Gattungsprozess*’ (genus process), which involves not only reproduction but also illness and death. In some way, species is operative in Hegel's explanations of sensation, illness, death, reproduction, and consequently his designation of animals as the peak of the

³⁵⁹ JS1, p.127. “Es ist die Mitte; die *Unendlichkeit* des Außersichseins ist an sich nach 2 Seiten außer sich; es ist die Erde, die sich um die Sonne bewegt, ebenso einen Mond um sich bewegt und in ihrem Sein Sonne und Mond von sich, aber so, daß sie als tätige die Kraft gegen den Mond nur von der Sonne hat, abhält; so das Organische, [das] sich gegen die Macht der Gattung, die es untergehen macht, sowie gegen die der unorganischen Natur erhält und sich um seine Achse für sich selbst bewegt, in sich selbst ist, sich erhält.”

³⁶⁰ JS1, p. 127: “*ein absoluter ununterschiedbarer Kreislauf*”.

natural world, because of the relation of two individuals of a species enacting a difference-in-identity relation in reproduction that borders on recognition.

What the examination of these roles reveals about Hegel's use of the *Gattung* concept is that:

1. these roles are all *processes or activities* (not figures or particular features)
2. they are processes that are peculiar to organic life and so a species is conceptually distinct from natural kinds more generally
3. they are processes which involve reactions to externalities, relations of individual to species, and interrelations between species members – and so are not just involved in the part-whole relations internal to an individual.

For Hegel, then, being a member of a species is not just a question of instantiating a universal, nor is it a question of embodying some characteristics; it is in engaging in particular activities. It is notable that so many of Hegel's accounts of organic activities require the notion of species. I will briefly unpack the role of species in the following organic processes: sensation, reproduction, illness, and death, in order to highlight the points (1-3) above. The third point in particular will be important for the broader purposes of the thesis.

Sensation and Reproduction

The role of sensation that Hegel expounds in the Jena work (focusing especially on 1803/4) involves three sets of relations: the relation between an individual and sensation, the relation between species and sensation, and third, the role of sensation as a mediator between individual and species.³⁶¹ The dialectic of sensation shows the role of the sensory capacities of the animal in its organic activities, for our purposes it is important that this includes the reproductive or genus process. That Hegel takes time to provide an account of the role of sensation in this process, in addition to his other discussions of the species process, indicates that Hegel's account of species is always bidirectional; species is not an abstract entity that directs individuals – the species of an individual and the species process enacted by individuals is something which that individual (via its sensory capacities) contributes to.

³⁶¹ Hegel claims that sensation determines the character of the two organic processes he previously identified (of the individual and of the genus). In this account, we are told that the activities of sensation are responsible for 1) the self-preservation or nutrition of individuals, 2) for keeping the individual in touch with the *Gattung*, as well as 3) keeping it separate from the *Gattung*, and, in addition, that 4) sensation's becoming "too dominant" in an individual organism is a pathology.

Following an account of the relation of individual to sensation,³⁶² then, Hegel turns to the role sensation plays in the determination of the species-process. First Hegel claims that “the organic individual in itself is species”.³⁶³ What is meant by this? Hegel could be saying that the individual is implicitly (but not yet explicitly) the species, opposing the in itself, to for itself.³⁶⁴ This interpretation would make sense in that Hegel describes a species *process*, and so has to explain a movement. Hegel adds that that “for sensation, individuality alone is universal, and for the individual its sublation in the species comes under the power of sensation”.³⁶⁵ Remembering that he has claimed that sensation that is responsible for determining the species process, and because, according to Hegel, sensation only ‘recognises individuality as universal’, I take this to mean that the *Gattung* can only be recognised in another individual in animals. In that case, this claim would suggest that the species-process has to take place via multiple individuals. Given this condition, Hegel seems to be claiming that the individual organism’s power of sensation is what mediates the species process, because it is what allows the individual to note a difference between itself and the species. The gap between the individual and its species is felt as desire in the individual; desire is such that is facilitated by sensing a gap between the individual and its “being-sublated”, its becoming species: “it is as the *satisfied* desire, that it becomes *gattung*, [*es zur Gattung geworden ist*]”. Sensation is also what allows the genus process to be carried out in individuals, by enabling an individual to find another of the same species. In uniting in reproduction, the two sexes are thought to disappear, and become simply species.³⁶⁶ Although, as ever with Hegel, this is not the entire picture, it should be clear from Hegel’s discussion that by means of sensation and reproduction the individuals play an important role in the constitution of their species.

Illness, Death.

The species-process that Hegel outlines is not just the reproduction of new species individuals, but also their illness and death. In this way, the phenomena of illness and death are necessarily connected to the notion of species, so, whatever is subject to illness and death belongs to a species and is not merely a natural kind. In this section I will briefly explain the role Hegel gives species in these processes. This will again demonstrate species plays a pivotal role in Hegel’s explanation of organic processes, and in so doing expands the sense of organic beyond the individual, within a wider network of relations and processes.

³⁶² The role of sensation in nutrition is as a mediator between the organic and its sublation of the inorganic (as what tries to negate its inorganic other, to consume and assimilate it).

³⁶³ JS1, p.166.

³⁶⁴ There are various lines of possible interpretation here. Hegel could also be indicating that he thinks the essence of the individual is the *Gattung* to which it (in some way) belongs (e.g. the essence of snoopy is to be a dog). I discuss the issue of essentialism below in chapter 8.

³⁶⁵ JS1, p.166.

³⁶⁶ JS3, p. 158: “Ihre Vereinigung ist das Verschwinden der Geschlechter einfache Gattung ist geworden”

But it is not immediately obvious why Hegel would connect species with the concept of illness. Why and how this connection between species and illness is made forms the subject of this section; I will suggest that in Hegel's account of an illness, the individual animal no longer properly expresses its species. The inadequacy, according to Hegel, of an individual with respect to the universal, its genus, he will later refer to as the individual organism's "original illness", its "inborn germ of death"³⁶⁷ – it is an unavoidable facet of the being of the organism. Key to the organism is that even though it has various parts and has three different systems, it is nevertheless an 'absolute unity'³⁶⁸ – and a unity that is created, as I've discussed, by self-referential processes. Like Schelling, Hegel was greatly influenced by the Brunonian system of medicine, especially as it was reinterpreted by Röschlaub.³⁶⁹ The resultant picture of illness is that a organ or system within an individual develops a level of activity that is disproportionate to its role within the individual. For example, in Hegel's account of cancer, the activity of an excited organ, for example, a skin cell, would develop a greater degree of activity than in a healthy organism (Hegel later articulates this as the organ 'not negating' itself) and thereby develops an independence that is detrimental to the functioning of the organism. When this imbalance occurs, Hegel gives the following analysis of what is happening with the universal:

With the disease, the animal crosses the limit of its nature; but the disease of the animal is the becoming of the spirit; in illness the universal has itself isolated the fluidity, which, since it is animated by the infinite concept of difference of the system and is absolute only as unity [*als Eins*] is not its universality and life, can only end in death, in which the opposites spend equally the life-principle and themselves.³⁷⁰

Here the destabilisation of the organism's unity is at the same time an 'isolation' of the universal. This means, I think, that the universal is no longer sufficiently expressed in the organism. If "the idea of the

³⁶⁷ "Seine Unangemessenheit zur Allgemeinheit ist seine ursprüngliche Krankheit und der angeborne Keim des Todes": GW 374-5 §375.

³⁶⁸ See JSI 170/GS 246-7.

³⁶⁹ As Nelly Tsuopoulos has shown, what was a theory of pathology in John Brown's work becomes in Röschlaub and Schelling's the basis of a theory of the organism as constituted through the opposition of sensibility, irritability, and reproductive forces. See Tsuopoulos, Nelly. 'The Influence of John Brown's Ideas in Germany', in *Medical History*, Supplement no. 8, 188, 63-74.

³⁷⁰ "Mit der Krankheit überschreitet das Tier die Grenze seiner Natur; aber die Krankheit des Tiers ist das Werden des Geistes; in der Krankheit hat sich das Allgemeine, die Flüssigkeit isoliert, was, da sie schlechthin von dem unendlichen Begriffe der Differenz des Systems belebt und absolut nur als Eins nicht ihre Allgemeinheit und Leben ist, nur mit dem Tode enden kann, indem in dem Gegensatze ebensowohl das Lebensprinzip als sie sich aufzehrt." JSI, p.179.

organic is that the universal and the totality be one”,³⁷¹ then, what happens here is that the totality is not unified with the universal, and the organism does not function as an individual unity.³⁷²

In the later 1804/5 system notes, Hegel’s explains illness and death (again by way of reference to the genus) in this very condensed statement:

Illness is a succession of processes; the organism cannot withstand them; the species, the universal, now comes to confront them, the animal dies, death of the animal the becoming of consciousness; it is the universal that bears the processes separately in itself and that can analyse itself; the space in which life perdures as interpreted as members, the simple processes in themselves, or processes that are immediately at rest, are universal.³⁷³

Leaving to one side the final point – that animal death in some way precipitates consciousness – if we focus on the role of species in Hegel’s description of illness and death we can see that:

1. illness is a succession of processes of some sort, and that
2. it is a ‘confrontation’ between the *Gattung* or universal and the processes of illness that results in the death of the organism.

In claiming that the organism cannot endure the processes of illness, Hegel is likely referring again to the unity of an individual organism as disrupted by the processes of illness – a system or process becomes isolated from the others in such a way that the functioning of the whole is no longer possible. When that happens, the organism no longer operates within the bounds of the species but becomes something that is opposed to it. It should also be noted that here, as elsewhere, Hegel doesn’t seem to be concerned with picking out what precisely belongs to this or that species, or how it is that an individual operates according to the species (or, after illness, as opposed to the species). By ‘*Gattung*’, Hegel could just as easily denote ‘animal’ as a narrower universal like ‘dog’. This ambiguity is significant because Hegel’s point is rather to explain a process in general – whatever the species under consideration might be, the type can no longer be sustained.

³⁷¹ JS1, p. 179.

³⁷² Von Engelhardt claims that the individual’s sickness, its conflict between the isolating processes and the totality of the organism, is at the same time a realisation of the relation between individual and species. Dietrich von Engelhardt, ‘Hegels Philosophisches Verständnis von Krankheit’, *Sudhoffs Archiv* vol. 59 no. 3 (1975), pp. 225-246: „Mit dem Zwiespalt zwischen individueller Integrität und Totalität und den sich isolierenden Körperfunktionen und Bewußtseinsdimensionen verwirklicht das Individuum an sich selbst das Verhältnis von Einzelem und Gattung.“

³⁷³ Hegel, JSIII 159-160. Trans. Krell, D.F, *Contagion*, p.134,

Hegel describes animal death as a sequence in which “the absolute essence of the animal raises [*aufhebt*] itself from the sunken being of existence, becomes species, universal in self.”³⁷⁴ The death of the animal isn’t a simple or cancelling or annihilation of itself – though the existent individual is annihilated – but also a ‘raising’ to the species or genus: “in the recognition of the child the animal has become species [*Gattung*], and its annihilation in it inhibits itself and opposes the established species.”³⁷⁵

As an individual, the (e.g.) animal is determinate in various ways, for Hegel this includes its sex determination. This is determinacy is also given as a reason for its death. Because the species is not one sex or another, but instead, “is in one unity, in a one, the unity of a complete whole”,³⁷⁶ and the individual is implicitly this species, the insufficiency of the individual compared to the species contains the very the possibility of illness. Hegel’s description is fragmentary and unclear, but for our purposes, I merely want to point out that species plays a part not only in reproduction, but also in sensation, illness and death of the individuals – it is linked to all of these organic processes.

Communal Life, Recognition

Because it is bound up with reproduction, illness, and death, Hegel’s descriptions of species processes are also significant for his set up of a transition from nature to spirit in his system.³⁷⁷ Sometimes in the 1803/4 fragments, he identifies illness as the key in the transition to spirit (“with disease, the animal breaches the limit of its nature, but the disease of the animal is the coming of spirit”³⁷⁸), at other moments, with death (‘the death of animal the becoming of consciousness’), and still others, Hegel emphasises the type of identity relation between two individuals involved in reproduction that requires an awareness of similarity between two organisms, what Italo Testa identifies as a form of “proto recognition”.³⁷⁹ Common to all those claims identifying various key elements in the transition to spirit is that these are all processes which Hegel presents as bound up with his conception of ‘*die Gattung*’ and are connected to each other insofar as they are aspects of the process of generation and so that species plays a role in their explanations.

³⁷⁴ JS1, p.181.

³⁷⁵ JS 1, p.167.

³⁷⁶ JS3, p. 165, trans. David Krell p. 153.

³⁷⁷ In his later philosophy of nature Hegel takes more care to note that animals have consciousness, there, the transition to spirit is a transition to a ‘higher’ level of consciousness.

³⁷⁸ JS1, p.179 (fragment 15).

³⁷⁹ Italo Testa, ‘How Does Recognition Emerge from Nature? The Genesis of Consciousness in Hegel’s Jena Writings’ *Critical Horizons* vol. 13 no. 2 (2012), pp. 176-196.

For Hegel, the child of the two individuals – considered in relation to the parent individuals – is an externalisation of the species. The recognition of the child as of the same kind, despite its differences, ‘borders on rationality’, because it requires the recognition of a universal (the *Gattung*) in a numerically and qualitatively different individual as of the same kind: “that the *Gattung* itself becomes an external of the animal in the child, that it differs from it, this externalisation of universality is the highest form of rationality of which the animal is capable.”³⁸⁰ Hegel suggests that because animals often tend to live and go about their business in groups, we could be tempted to think that they “present a higher relation to the species”. But for Hegel, for the individual animal to bear a relation to a universal as such (recognising it as a universal) is not possible on the level of natural explanation alone. For Hegel, such a relation can only occur on the level of rationality (spirit), which he won’t acknowledge in animals.³⁸¹ It seems initially as though Hegel is somewhat desperate to preserve the integrity of an animal/human divide – so let us try to unpack this claim a little. What he thinks is lacking in the relation to the universal in animals is that the species is here remains only a collection of individuals:

it is therein related to the species not as to individual but itself as to universal and in relation to the individuality as membered in itself, in which they live in herds and feeds together, they live communally, it has the presentation of a higher relation to the species, but the universal here is nothing but a quantity of individuals, not a simple universal as such; that the universal exists as such, with the immediate transformation of individuality in simple universality the organic crosses over to reason.³⁸²

Something else is needed, for Hegel, for the relation between the individual and the species to be more than a collection of individuals; but a minimal requirement is that the species involves the coming together of these individuals in such a collection.

7.3 GROUNDING ORGANIC KINGDOMS

³⁸⁰ JS1, p.167.

³⁸¹ It is not clear to me, in principle, why.

³⁸² “Aber dies Allgemeine ist hier selbst nichts als eine Menge von Einzelnen; sie ist nicht ein allgemeines Einfaches als solches“. Hegel, JS1 Fragment 14, pp. 243-244/176.

In this section, I claim first, that one of the more important functions of the concept of species is that it is used in Hegel's explanation of the difference between plant and animal kingdoms.³⁸³ In doing so, his discussion gives the differences between plants and animals an ontological basis such that they are distinguished in kind – rather than merely by degree. By focusing on this aspect of Hegel's use of the species concept, I also claim that in his philosophy of nature Hegel departed from the prevailing explanation that had distinguished plant and animal realms. Following more or less closely from Aristotle's *De Anima*, it was traditionally common to distinguish animal from plant kinds via the possession of diverse functions. Whilst echoes of this are present in Hegel, as in Schelling and Kierkegaard, as has been shown in the previous chapters, Hegel introduces a new conceptual scheme for thinking about the differences between kingdoms that makes use of his species concept. More precisely, as I will develop in this section, the difference between plant and animal forms of life are explained as each expressing different forms of relation between individual and species, and notably, this explanation is prior to their differentiation in terms of functions. This is surprising because of the tendency to understand Hegel as generally Aristotelian in his outlook. His discussion of the two kingdoms is also interesting because it suggests that with regard to the plant-animal distinction Hegel is not making a distinction that is thought to be merely conceptual. The second point of importance in this section is that this discussion will also provide material to consider Hegel's view of the relation between individuals and species, which I will argue should not be taken as a part-whole model.

The chapter will accordingly proceed as follows. First I will outline Hegel's explanation of the plant-animal distinction, to show that this is explained via two different types of relation between individual and species. This exposition will then be used to show how Hegel diverges from the Aristotelian tradition whilst developing his own method of understanding the difference between these two kinds, though both are still understood as specifically organic. Finally, I will examine the relations of species to individual presented there to suggest that Hegel does not understand the idea/ species as made up of individuals in which each sex expresses 'half' an idea, rather, each individual expresses it fully.

According to Hegel's 1803/4 notes, plants are the simpler of the two 'existences' of the organic (plant and animal).³⁸⁴ And, as outlined in the previous sections, Hegel holds that organic individuals, whether of plant or animal, all contain two inseparable elements: individual [*Einzelheit*] and species [*die Gattung*]. Each of these two elements or 'moments' of the organic, individual and species, involves the

³⁸³ My account here differs from others which focus on Hegel's later writings; Kierkegaard, for example, shows that in Hegel's later work, life is the basis of this distinction. See Anton Kierkegaard, 'Logical and Natural Life in Hegel' *European Journal of Philosophy*, (2021): 1-19.

³⁸⁴ Hegel claims that there are two ways in which 'the organic' actually exists: as plant and as animal. Of these, he calls plants the 'simple existence' of the organic, and the role of the genus concept in Hegel's discussion of plants tends to appear in contrast with its role in the animal: plants are always 'not yet' bearers of the degree of individualisation that he attributes to animals

other: “the individual, as the cycle of its processes, is at the same time always the whole, the species”³⁸⁵. But whilst both elements are thought to be inseparably bound together in any plant or animal being, the relation that the two elements have to each other differs.

The relation of these two elements to each other forms two processes:

- a) that of the individual positing itself as universal, and
- b) the process of subsumption of the individual under the idea.

How do these processes play out in plants, according to Hegel? In plants, he says, the two processes coincide. The claim seems to be that for the plant, the process in which the individual is posited as a universal (it reproduces itself) and the process in which the individual is subsumed under the idea – becomes an instance of the species – are not distinct processes when we examine the course of plant life:

in a sense the individual can be called immortal [*unvergänglich*] in that it is itself always the species and its articulation together with the preservation of the species, for it does not perish in the species-process, is not divided into the opposition of the sexes, but the process of the individual, in which it is posited as universal is in itself membered [*gliedert*], and the inverse in which it is subsumed under the idea coincide; its articulation is immediately its disintegration in the individuals of the species, the individual as such exists as a multiplicity of individuals; the idea, the species, is too weak, so to speak, to be broken into opposed individuals and to be assigned sexual differentiation.³⁸⁶

This passage attributes a kind of immortality to the plant. This is because for the plant its articulation or division into parts is at the same time its preservation. First, when plants grow, the original part of the plant doesn’t have to form a clearly separate entity from the new part. And when they reproduce (unlike with the propagation of animals), the parent plant does not appear to shortly die out, the plant ‘does not perish in the species process’. This seems to be because the growth of the plant and the reproduction of the plant are not processes that exclude each other.

Hegel then goes on to claim that the different relation is due to the “weakness” of the species (or the idea) to be dispersed into either 1) a genuine multiplicity of distinct individuals, or 2) into separate

³⁸⁵ JS1, p. 131

³⁸⁶ JS1, p. 131

individuals of female and male sex. The reference to weakness or strength of the idea reflects the level of differentiation demonstrated by the kind. More distinct individuals, and of separate sexes, are thought to be greater differentiations than those appearing in plant growth. So Hegel's assertion is that the species need not be as strong in plants as it is in animals, where it needs to endure in such stark differentiations. Accordingly, regarding individual plants, Hegel claims that

the articulation [*Gegliedderung*] in itself only happens in an external, superficial or successive difference, and the process of the species, the fragmentation of the idea is likewise formal.³⁸⁷

By holding that the articulation of differences in the plant happens spatially (in different parts) or temporally (e.g. first the bud is present, then the flower) the differences are held apart, rather than simultaneously present. It is for this reason that he claims that the fragmentation of the idea is 'formal' – the idea isn't really explicitly divided into an expression in completely distinct individuals.

In his further system sketches of 1805/6 (JSIII), Hegel differentiated plant from animal organisms in a similar way, with different emphasis; here once again it is clear that it is the role played by species that is decisive. Where previously the weakness of the species was emphasised, here he points out that plants are nonetheless the first organic beings where species has 'predominance':

The plant is the immediate organic individuality in which the species [*Gattung*] has predominance; and the reflection is not individual, the individual does not go back into itself as such, but is something other, not a self-feeling. This is the character of its entire process.³⁸⁸

But the difference between plant and animal is characterised such that in the plant, the individual is not completely 'reflected back' into itself. What is lacking is that the individual is not reflected *as individual*, which is to say that in plant development, the part does not refer back to a distinct whole (it can even exist without it, as in plant cutting and striking). The absence of complete reflection of the individual here differentiates the plant's mode of existence from the degree of self-awareness afforded in the animal, where the process of a plant's development is construed as an expansion without complete return to self.

³⁸⁷ JSI, p. 131.

³⁸⁸ JSIII, p. 120: ("Die Pflanze ist die unmittelbare organische Individualität, worin die Gattung/ das Übergewicht hat, und die Reflexion nicht individuell ist, das Individuelle nicht als solches in sich zurückgeht, sondern ein anderes ist, kein Selbstgefühl. diesen charakter hat ihr ganzer Prozess").

According to Hegel, only *parts* of plants are present in the process of plant fertilisation, and not entire individual plants. This is taken as evidence for his supposition that plants are less sexualised than animals. Hegel adds that “different individuals cannot be regarded as different sexes because they are not completely immersed in the principle of their opposition”, and “does not completely permeate them”. Because both male and female sex organs can be present on different parts, in different numbers, across the same individual, being male or female in plants “is not a universal moment, not a principle of the whole individual, but a separate part of the same, and both only relate to each other according to this part.”³⁸⁹

Although the differing capacities of plants and animals is something Hegel is keen to explain,³⁹⁰ with this account of the differing relation between individual (re its parts) and species in the reproductive process, Hegel departs from a plant-animal distinction that rides on the possession of a different amount of organic functions. Following more or less closely from *De Anima*, the Aristotelian tradition had commonly identified different parts or capacities³⁹¹ of the soul.³⁹² This strand of thinking had therefore distinguished animal from plant kinds via the possession of diverse functions – for Aristotle, plants were possessed of a nutritive soul (organising principle), animals of both nutritive and sensitive, and humans nutritive, sensitive and rational. In the Aristotelian picture, then, the number of diverse types of soul grounded the number of functions held - a greater number for animals than plants, and for humans than other animals.

Whilst (for reasons that will be developed further with the investigation of the *Phenomenology*) Hegel doesn't present his own taxonomy of plants or of animals, here he does seem to be concerned with giving an ontological basis of our thinking about plants and animals as fundamentally different.³⁹³ For

³⁸⁹ “Die Moneozisten und Dieozisten sind zwar getrennte Geschlechter, und machen einen Hauptbeweis der Befruchtung aus; abser die verschiedenen Individuen keonnen nicht als vershchiedene Geschlechter angesehen werden, weil sie nicht in das Prinzip ihrer Entgegensetzung eingetaucht sind; weil es nicht sie ganz durchdringt, nicht allgemeines Moment ist, nicht Prinzip des ganzen Individuums, sondern ein abgeschiedener Teil desselben, und beide nur nach diesem Teile sich aufeinander beziehen. Das eigentliche Geschlecht muss zu seinen entgegengesetzten ganze Individuen haben, deren Bestimmtheit, in sich vollkommen reflektiert, sich uber das Ganze verbreiten.” JS3, p.133.

³⁹⁰ Like Kiemeyer and Schelling, he utilises the capacities of sensibility-irritability-reproduction to discuss organic life, but does not decline to attribute e.g. perception and movement to plants. His understanding of the distribution of these capacities seems to follow more or less a continuum but with all organisms having all in some way or other, as Kiemeyer laid out.

³⁹¹ It has often been thought that Aristotle uses the terminology of ‘part’ of the soul and ‘capacities’ of the soul interchangeably, which has been the standard reading. Whilst recent interpreters such as Whiting point to difficulties with this equation, for my purposes what is important is how Aristotle was commonly historically understood. See Jennifer Whiting, ‘Hylomorphic virtue: cosmology, embryology, and moral development in Aristotle,’ *Philosophical Explorations*, vol. 22 no. 2 (2019), pp. 222-242

³⁹² Soul for Aristotle (*De Anima*) is defined as the first actuality of a natural body which potentially has life, (412b5-6) 412b5 (first actuality of a body which has organs). 412a27-8.

³⁹³ It has been key to some readings of Hegel's view of species that there is no clear distinction to be drawn between kingdoms, genera, species and so on (c.f., for example, Lindquist, ‘On Origins and Species’). We do observe, more or less, a continuum for Hegel, but there is this absolute differentiation via relation to genus. Plant and animal not just doing the same thing better or worse but are actually doing different things.

Hegel, then, the division between plants and animals is 1) based on something inherent in the plants or animals themselves, and 2) something that is not arbitrarily selected. This discussion also provides further confirmation that Hegel likely uses the notion of *Gattung* at a lower level of generality than kingdom.

Hegel's use of the relation of species and individual to give an ontological grounding for the difference between plant and animal kingdoms is also significant because it was frequently thought that divisions such as species were natural and that divisions in more general taxa (genera, order, kingdom) above were mere convention. However, Hegel uses species to give reality to the distinction between kingdoms.

Finally, this analysis has shown that because the relation between species and individual is key to the distinction between plant and animal kinds, and because Hegel seems to privilege sexual differentiation and reproduction in his account of the species-individual relation, Hegel's distinction of kingdoms is distinctly *biological* – unlike other ways of thinking about natural groups, Hegel emphasises the 'generation' aspect of species, by focusing on sexual differentiation and reproduction in his account of the distinction between plants and animals. This shows that Hegel attributes special status to organic beings. But in what sense is the idea meant to be 'fragmented' in animals? We know that Hegel claims the fragmentation of the idea in plants is lesser and 'merely formal' in comparison to that of animals, and that division into sexes is an important part of Hegel's understanding of animals. But in addition to this, Hegel claimed that with the division of the kind into sexes that each was the "whole idea" [*die Ganze Idee*].³⁹⁴ If we take that claim seriously, then Hegel doesn't understand the idea as like a pie cut into two halves (along the lines of Aristophanes' story in *The Symposium*). This form of part-whole relation, at least, cannot be what is intended by Hegel here.

Summary

In 7.1, I gave a reading of Hegel's claim that species is 'the existent idea'. I suggested that the species individual relation is not simply a one-way, top down determination. In this way, Hegel could be seen to be employing a form of organic reasoning, or mutual determination, to his account. In 7.2, I looked at the various process that species plays a role in. In 7.3, my aim was also to show that Hegel's account of the role of species goes beyond this to also ground the plant-animal distinction in a way that affords it

³⁹⁴ JS I "Die Idee der organischen Individualität ist Gattung, Allgemeinheit; sie ist sich unendlich ein anderes und in diesem Anderssein sie selbst, existiert in der Trennung der Geschlechter, deren jedes *die ganze Idee* ist...".

species a greater role than in other traditional philosophical accounts, that tend to explain the difference via the quantities of functions possessed, rather than grounding those in a species-individual relation. Given all these roles that species plays, we can now approach Hegel's views on taxonomy and essentialism in the final chapter.

8: CRITIQUES OF TAXONOMIC PRACTICES AND ESSENTIALISM

I have claimed that Hegel was not overly concerned with proposing taxonomic principles. But because he does touch on this issue, I will address these instances here. The most lengthy mention of principles of taxonomy is found in the *Phenomenology*. There, he also discusses ‘*Merkmale*’ of e.g. animals, but this doesn’t seem to come up in his discussions of nature in his Jena lectures. This could mean that for Hegel this is only a pertinent philosophical issue from the standpoint of the phenomenology, because the activities examined in ‘observing reason’ do not approach nature from the same level or with the same goals as philosophy of nature.

When Hegel considers inadequate methods of scientific classification – especially regarding species of plants and animals – in the *Phenomenology*, his treatment of these methods develops out of an initial focus on assessing the claim that ‘rational observation’ of objects is the key part of scientific method. In this section I will draw out four critiques Hegel makes of scientific classification in the *Observing Reason* section of the *Phenomenology of Spirit*: a) superficiality and b) misconstrual of the role played by the observer, c) arbitrariness, and d) artificiality of categorisation. Whilst they are not all directed at the same conception of scientific method, they can all be understood to form part of Hegel’s more general concerns about projects of categorisation that force the objects of study into rigid formal systematisations. The aim of drawing out critiques of taxonomic principles from the *Phenomenology* is to compliment the claims that 1) philosophy of nature proper is not focused on taxonomy, and 2) hence what is of interest to Hegel in his discussions of *Gattung* is goes beyond taxonomic and classificatory issues. I will then situate the account of Hegel I’ve given thus far in terms of the current scholarly debates about Hegel’s ‘essentialism’.

8.1 Remarks on Taxonomy in the *Phenomenology of Spirit*

As mentioned above, the *Phenomenology* deals with shapes of consciousness – that is, modes of understanding consciousness has *of itself* and *of its object*. Unlike the *Systementwürfe* passages examined above, this puts Hegel’s work here firmly in the domain of epistemology insofar as he looks at the difficulties encountered by various forms of this relation of consciousness and its object, where adequate knowledge would be an identity between consciousness and its object of investigation.³⁹⁵

³⁹⁵ More complicated pictures can be found in other commentators, but this should be sufficient for my purposes.

The shape of consciousness which holds science to be the observation of objects has overcome the idea that only some supposed bare phenomenal experience of a passive subject is knowledge – this was already dialectically sublated in the ‘Consciousness’ chapter of the *Phenomenology*. Two aspects are important: that the subject is not passive, and that knowledge cannot be an indeterminate phenomenal experience. Given this starting point, observational consciousness requires that its object of study “should have the significance of a universal, not of a sensuous particular”³⁹⁶ in order to count as an object of a scientific observation rather than just some particular sense experience. As a consequence, consciousness “will not let the perception that this knife lies alongside this snuffbox pass for an observation”³⁹⁷ – such an observation would be too particular to be scientific. But what kind of observation will be sufficiently general?³⁹⁸ The initial mode of observing consciousness that Hegel addresses is that which is engaged in the process of describing objects.³⁹⁹

At this juncture in Hegel’s account, the attempt to focus on taking up sense-objects into universals is expressed in the activity of describing objects in turn using terms shared between them. As Stern puts it: “because it recognises that things share universal properties, observing reason begins by attempting to describe the world in as much detail as it can”.⁴⁰⁰ This involves memory of the object (rather than understanding), “which expresses in a universal way what in actuality is present only as a single item”.⁴⁰¹ Remembering past toads, we call what is in front of us a toad, and then move on to the next object, but this present, existing toad is an individual, and is completely unique, though the *universal*, “toad”, is not present in the same way. But when science merely aims to describe objects in this way, the describing activity itself actually becomes its main preoccupation:

this superficial raising out of singularity, and the equally superficial form of universality into which the sensuous object is taken up, without becoming in its own self a universal, this activity of describing things, is not yet a movement in the object itself; the movement is only in the describing of the object. The object, as described, has lost its interest; when one has been described, then another must be started on, and continually looked for, in order that the activity of describing shall not come to an end.⁴⁰²

³⁹⁶ PS, s.244, Miller p.147.

³⁹⁷ PS, s.244, Miller p.147.

³⁹⁸ Hegel claims that this universality has to be something more than the ‘it is mine’ – knowledge of an object requires more than that they are equally objects for this consciousness. see section 245.

³⁹⁹ The problems inherent in ‘description’: superficiality and acknowledging the role of the observer.

⁴⁰⁰ Stern, *Structure of the Object*, p.122.

⁴⁰¹ PS, s.244

⁴⁰² PS, s.245, Miller p.148.

With the claim that the ‘movement’ is not in the object itself, Hegel likely means to indicate that it is the subject that is doing the work of remembering, selecting, and comparing which properties salient for categorisation. While an object may have many properties, in classifying it, only certain properties are selected to be taken into account. These activities on the part of the subject lead Hegel to the claim that there is something superficial about this method. The activity of subsuming objects under universals only touches the surface of the thing from the outside, rather than letting the object of study express something of its own activity itself. This method therefore also involves a corresponding lack of transparency to go along with this superficiality, in failing to acknowledge the role of the observer in making categorisations, revealing the gap between the intention of the scientist and the practise of their method. As an example of the kinds of view Hegel opposes here, Ferrini quotes Gren’s *Grundriß der Naturlehre*, where Gren claimed that “Experience is called an observation when we leave things in the state in which they are found without our activity.”⁴⁰³ Hegel takes the claim that the scientist merely passively receives what is observed to be inaccurate – perhaps even dishonest, if the - because it underplays the role of the subject’s activity.

Hegel adds that the activity of ‘describing’ like the one outlined above cannot be exhausted via limiting the objects of study. For even if novel objects to describe are no longer readily available, the activity of accumulative description can continue:

we must go back to those already found, divide and analyse them further, and bring to light fresh aspects of thinghood in them. This restless insatiable instinct can never run out of material; to discover a new genus of major importance, or even a new planet, which, although an individual, possesses the nature of a universal, can only be the lot of a lucky few. But the line of demarcation of what is *distinctive* of say, an elephant, oak, gold, of what is *genus* and what is *species*, passes through many stages into the endless particularisation of the chaos of animals and plants, of rocks, or the metals, earths, etc., that only force and skill can bring to view. In this realm where the universal is undetermined, where particularisation approximates again to *singleness*, and again here and there descends to it entirely, there is opened up an inexhaustible supply of material for description and observation.⁴⁰⁴

In this passage, the potential infinity of the ‘describing’ activity is put down to the ‘approximation’ to ‘singleness’ of particularisation. What is meant by this is likely that, because in some respect every object is unique, or exhibits some property or other by which it can be numerically distinguished from another

⁴⁰³ (Gren 1797, §11). Noted in Ferrini, *Reason Observing Nature*, p.94.

⁴⁰⁴ PS, s. 245.

(even if this is only spatial location), so that each object could theoretically be the only one in its class. Moreover, this particularisation and the plurality of properties that could be selected for determining the class of an object mean that many different groupings can be applied to the same objects.⁴⁰⁵ For example, one could group toads into sub-species according to texture (of a smooth brown toad, a smooth green toad, and a warty green toad) or colour, with different results. Because of this, the question of which feature is salient to form a grouping, and how many groups and how finely grained they are (when to begin a sub-species) could, as Hegel writes, pass through many stages into 'endless particularisation'. In which case, scientific investigation would not provide explanations that would be transferrable from one thing to another (e.g. we might expect similar explanations of behaviour among dogs if two things can be identified as both dogs, which are more similar than e.g. a brown dog and a brown cat).

Given this potential plurality of species, the question of which features of objects are selected to categorise them arises. Why are toads categorised according to one criterion (e.g. wartiness) and not another (e.g. colour), for example?

but here, at the boundary line of the universal where an immense field is opened up for that instinct, it can have found not an immeasurable wealth, but instead merely the bounds of nature and of its own activity. It can no longer know whether what appears to possess intrinsic being is not really something contingent. what bears in itself the impress of a confused or immature feeble structure, barely developing out of rudimentary indeterminateness, cannot claim even to be described.⁴⁰⁶

Difficulty in knowing the reason why one determination has been chosen would be problematic because it would entail that the supposedly scientific categorisations, by which we aim to understand things better, would actually be either arbitrarily⁴⁰⁷ selected or rely on some contingent condition. Hegel adds that in fact,

what enables things to be intelligently apprehended is more important to it [the scientific mode of describing] than the rest of the complex of sensuous properties which, of course, the thing itself cannot dispense with, but which consciousness can do without.⁴⁰⁸

⁴⁰⁵ This kind of problem is called 'cross-cutting' in contemporary literature; see Henry, [] 2011.

⁴⁰⁶ PS, s.245/ Miller p.148.

⁴⁰⁷ Hegel's discussion of instinctive operations claims that an apparent 'instinct of reason' or 'feeling of necessity' is really a contingency.

⁴⁰⁸ PS, s.246/ Miller p.148.

The thing itself is a *unity* whose component properties are not separable in actuality – this toad exists *as* green, smooth, etc. But the describing mode of scientific consciousness decides on a property to abstract that is essential – necessary for its apprehension as the kind of thing it is:

through this distinction into what is essential and inessential, the concept rises above the dispersion of the sensuous, and cognition makes it clear that it is just as essentially concerned with its own self as with things.⁴⁰⁹

Here the role of the observer in this process is brought to the fore again. For this moment of observing reason recognises the role it plays in making a distinction between what is essential and inessential. Working out what features to pick out as essential enables a non-arbitrary account of how to group things. This involves picking out the differentia [*Merkmale*], the aspect of the individual by which its species can be selected.⁴¹⁰ But this recognition points to yet another issue, a sceptical moment on account of the duality between the differentia as picked out by the observer and the differentia as an essential mark of the species itself: “This duplication of what is essential gives rise to hesitation on part of cognition is so also with respect to thing.”⁴¹¹ This suggests that observing reason’s goal is not merely formal, that is, 1) it does not divide and group items simply for the sake of convenience, aiming simply to form an internally coherent system of categories. More than this, 2) science (on this view) does not aim for an artificial taxonomic system where groupings are only on the side of the observer, but instead aim to reflect structures inherent in nature itself – to ‘cut nature at the joints’, as the saying goes.⁴¹²

differentiae are supposed not merely to have an essential connection with cognition, but also to accord with the essential characteristics of things, and our artificial system is supposed to accord with nature’s own system and express only this.⁴¹³

and,

on the one hand, the differentiae enable cognition to distinguish one thing from another; but on the other hand, it is not the unessential aspect of things that has to be known, but that characteristic whereby the things themselves *break loose* from the general continuity of being as such,

⁴⁰⁹ PS, s. 246/ Miller p.148.

⁴¹⁰ *add a short discussion/ reference back to Linnaeus here, and the artificial system/ method*

⁴¹¹ PS, s. 246/ Miller p.149.

⁴¹² This image goes back to Plato (*Phaedrus* 265e).

⁴¹³ PS, s. 246/ Miller p.149.

separate themselves from others, and are explicitly for themselves...⁴¹⁴

The view is presented here that to be a proper differentia, rather than just a property used in forming a category, is not only to isolate a feature that is inherent in nature, but to recognise a feature by which the type under consideration *distinguishes itself* from individuals of other kinds. An animal might distinguish itself from others via its behaviours, and the scientist, on this view, might use some aspect important for these distinguishing behaviours to isolate a kind. Hegel then adds that...

the distinguishing marks of animals, e.g., are taken from their claws and teeth; for in point of fact it is not only cognition that thereby distinguishes one animal from another, but each animal itself separates itself from others thereby; by means of these weapons it maintains itself in its independent and in its detachment from the generality.⁴¹⁵

Before looking at this paragraph in more detail, I would like to note an exegetical problem. In part this problem arises from the context of the *Phenomenology* (as an exposition that progresses between different shapes of consciousness – consciousness' idea of itself and its relation to objects). Following this consideration of taxonomies as the primary mode of scientific activity, the *Phenomenology* goes on to examine the project of forming laws and then other activities. Because of the general context of the *Phenomenology*, it could be surprising then that commentators often take Hegel's discussion of differentiae (weapons and claws) as a straightforward commitment.⁴¹⁶ Reference to differentiae suggests that what is at issue concerns not only particular individuals but how species distinguish themselves from one another in ways that . Is this Hegel's considered view or does this claim appear as part of the dialectic of natural consciousness, soon to be sublated?

I cannot find a similar assertion in the notes from Hegel's Jena lectures. However, a similar mention of claws and teeth can also be found in a remark in his later *Encyclopaedia* (1817). There he writes that:

for the determination of the species [*Spezielle*] however, the distinguishing characteristics [*die Unterschiedungsbestimmungen*] have, by a happy intuition [*richtiger Instinkt*], been selected from the animal's weapons, i.e. its teeth and claws etc. This is valuable because it is by its weapons that

⁴¹⁴ PS, s.246 / Miller p.149.

⁴¹⁵ PN, p.149.

⁴¹⁶ For example, Lindquist cites this reference from the *Encyclopedia Zusätze* as evidence for his position. On the other hand, I agree with Ferrini's claim that the *Phenomenology* does not only contain critical statements regarding shapes of consciousness or the regard he may have held contemporaries who reflected these shapes, but also provides indications of his positive views and his preferences for certain views over others in contemporaneous discourse. In these paragraphs in particular, some of the claims from the *Systementwürfe* are also reflected and retained in the *Phenomenology*.

the animal, in distinguishing itself from others, establishes and preserves itself as being-for-self.⁴¹⁷

In this method, which is not regarded as negatively as some of Hegel's other allusions, the role of the animal's own activity is reflected in the selection of the differentiae. Such a principle is held in higher regard because it aims to use the mark to signify *the animal's own activity of individuating* itself. It is also thus thought an advance in that it acknowledges that in this way (having their own individuating activities) animals are fundamentally unlike plants and should not be treated of in the same way. The context of this *Encyclopaedia* remark is a discussion of zoology and comparative anatomy, in which Hegel claims that the 'preoccupation' with classification of animals into 'artificial' orders and classes using distinguishing characteristics [*merkmale*] had got in the way of "taking in the objective nature of the forms themselves".⁴¹⁸ He credits comparative anatomy for generating scientific observations that tend to 'conform to the concept'.⁴¹⁹ For example, the universal type 'animal', has been furthered by comparing animals from their 'barest initial indication' to variety of forms 'which appear in an extremely imperfect and disparate manner'. Development of a scale of animals, i.e.. comparison, also allows the significance of the interrelated organs and functions to be grasped.

He claims that thoughtful observation by naturalists has resulted in:

1. plants into mono and dicotyledons, and animals into invertebrates or vertebrates (which Hegel takes to be a return to Aristotelian principles),
2. the importance of habit of the forms as determining the construction of the parts,
3. and that the habit of individual forms is shaped by nature according to the organism's environment.⁴²⁰

Taken together, I think that these paragraphs suggest that Hegel isn't recommending that e.g. claws as the basis for a universal taxonomy. I think this is instead a descriptive statement about certain practices that highlights something particular about the advantages of that approach over others – that using this approach points beyond the *Merkmale* themselves and looks at the activities of the whole animal in distinguishing *itself* from its milieu – it becomes what it is through its activities in the world. It is for this reason that he calls this supposition by naturalists a 'correct instinct'.

⁴¹⁷ Petry p. 178 (and Hegel, *Werke*, Suhrkamp bd. 09, section 370, remark).

⁴¹⁸ Petry p. 177 (and Hegel, *Werke*, Suhrkamp bd. 09 p.500, section 368).

⁴¹⁹ *Werke* 9 p. 500.

⁴²⁰ Hegel takes the organism's environment to include its surrounding plants and other kinds of animals, as well as geographical climate etc.

the plant, on the other hand, does not attain to a being for self but merely touches the boundary line of individuality. it is at this boundary therefore, where there is a show of division into sexes, that plants have been studied and distinguished from one another. What however stands on a still lower level cannot itself any longer distinguish itself.⁴²¹

In summary, the critiques of taxonomic projects that have been suggested in observing reason are, first, that if taxonomic activity is all on the side of the subject, the object becomes a dead thing, with an arbitrary property abstracted – this is a problem with abstracting single marks to make distinctions, rather than the whole organism. Second, a universal classification project doesn't take account of the differences between phenomena of different natural realms (what works for one way not work for another, because the way that different lumps of iron are related to each other is likely not the same as a capybara and its baby) – differences between kinds of objects is not captured by a rigid system of categorisation. Third, through nature's tendency to particularisation the project of categorisation doomed to fail because we can always make further distinctions between members of a class.

Taken together, these criticisms of various models of scientific classification reveal a concern about a violence done in the project of categorisation that is at odds with nature's tendency to particularisation and the differences between different kinds of subject of investigation. Hegel seems more influenced by the more general romantic concerns about divisions that are formal or abstract, and thus divide up what should be regarded as a unity. I think that this is a side of Hegel that is harder to discern in his later works – looking at the science of logic or the later *Encyclopaedia*, the rejection of 'artificial' classification is retained but the romantic inflections are lessened. Artificial systems are later criticised mainly for not 'conforming to the concept'.⁴²²

Hegel's less critical view of the claws section in the phenomenology suggests that he approves of thinking about the *Gattung* in terms of how it grounds activities and appears to be read back from those activities of self distinction. More importantly, Hegel's comments suggest that certain 'phenomena', i.e., animals, play a role in their own distinction from other kinds.

8.2 Essentialism and Hegel's Jena Philosophy of Nature

⁴²¹ PS, p. 247/8.

⁴²² I am thinking, for example, of Hegel's critique of understandings of disease that focus on proportions of chemicals (as e.g. Brunonian medicine and systems influenced by it). These are problematic for Hegel not only because they lack reference to the concept of the organism. see. e.g. Remark §359/ PN III. 143-144 / GW 359-360.

The discussion of Hegel's views on taxonomy in the *Phenomenology* we have just looked at features importantly in recent scholarly debates about Hegel's essentialism; the reading I have outlined of Hegel's account of species across his earlier works indicates a particular view of how a species constitutes the essence of an individual.⁴²³ In brief, I will now suggest that Hegel's Jena writings and the *Phenomenology* advocate a kind of essentialism in which species plays a crucial role as the essence of an individual, but – as I have been emphasising, and departing from helpful recent scholarship on Hegel's later work – the individual also contributes to the constitution of the species of which it is a member. The main purpose of this subsection is to situate this reading of Hegel's view of species in the contemporary literature.

In the last few years, the debate in question has been developing between those who consider Hegel to be an essentialist regarding natural kinds, such as Knappik, or Stern,⁴²⁴ and those who read him as a constructivist, such as Lindquist.⁴²⁵ Of course, essentialism doesn't have one meaning, and it makes little sense to argue about whether or not Hegel is an essentialist without prior agreement on what is meant by the term 'species' either.⁴²⁶ There are at least two questions at stake in this debate: whether there is a shared essence between members of a kind, that can be used to explain their features or behaviour, and whether an individual must necessarily have a certain essence.⁴²⁷

A helpful place to begin is Ereshefsky's summary of essentialism in contemporary philosophy of biology. In contemporary philosophy of biology, common principles of essentialism include the following: "all and only the members of a kind have a common essence", "the essence of a kind is responsible for the traits typically associated with the members of that kind", and "knowing a kind's essence helps us

⁴²³ I do not enter into the debates as they pertain to Hegel's later works here for reasons of space; as I have mentioned before, recent work on species on Hegel tends to either to focus on Hegel's later views of logic and nature or to draw on all periods of Hegel's work indifferently. I believe that important aspects of Hegel's terminology and his views changed, but that some of what I have to say here can be applied to Hegel's mature work, although I will not spell out precisely how here.

⁴²⁴ Franz Knappik, 'Hegel's Essentialism. Natural Kinds and the Metaphysics of Explanation in Hegel's Theory of 'the Concept', *European Journal of Philosophy* 24:4 2016.

⁴²⁵ Daniel Lindquist, 'On Origins and Species: Hegel on the Genus-Process,' *Hegel Bulletin* 41/3 (2020), pp. 426–445. This attention has been often focused (at least in Lindquist and Kreines) on its role in the later *Science of Logic*, or draws from Hegel's corpus indiscriminately across time. Knappik explicitly states that he focuses on Hegel's 'mature system', in the years following the *Phenomenology* (p.762). In this section I take Knappik as the paradigmatic advocate of an essentialist reading, and Lindquist as the paradigmatic representative of a constructivist; see also Márcio Suzuki, 'Reproduction versus Metamorphosis: Hegel and the Evolutionary Thinking of his Time', *History and Philosophy of the Life Sciences* vol. 42 no. 3 (2020), pp. 1-22 for a similar view.

⁴²⁶ Asking "is Hegel an essentialist about species?" requires answer to the question of the relation between 'species' as we use it now, and 'Gattung' as it appears in Hegel's texts, as well as an assumption that it is always used in the same way for the same level of generality (e.g., kingdom, genus, species). We will continue to use the terms in question as I outlined towards the beginning of the chapter.

⁴²⁷ These two questions broadly correspond to Knappik's distinction between essentialism about universals and essentialism about individuals: cf., Knappik, 'Hegel's Essentialism', p. 769.

explain and predict those properties typically associated with a kind.”⁴²⁸ Some of these are clearly views held by Hegel; for Stern, for example, the ‘concrete universal’ plays a unifying role as something in the individual which holds together the parts and explains them,⁴²⁹ and such a reading of Hegel would be committed to at least the second two.

Knappik’s reading makes particularly clear that Hegel does not need to hold the first of the abovementioned principles of essentialism, however – not all members of a species need to have every characteristic that is supposed to be part of the essence of their species. On Knappik’s view, Hegel presents an “explanation based argument” for “natural kind essentialism”, and he equates natural kind essentialism with what he sees as Hegel’s conceptual realism. For Knappik, “Hegel’s natural kind essentialism can be analysed as a conjunction of (a) essentialism about individuals with regard to their membership in natural kinds and (b) essentialism about universals with regard to universals that are natural kinds.”⁴³⁰ Knappik’s view is that Hegel’s natural kind essentialism makes ‘genuine explanations’ possible – ‘natural kinds can support explanations’ because of their modal features; the idea is that some given phenomena can be explained as necessitated by the essence of the kind under consideration. But this ‘essence’ is not characterised a set of individually necessary properties that every instantiation need possess – so what the essence is and does (on Knappik’s account of Hegel) is the next question. His answer is that there is a teleological structure to organic nature (and spirit). This means in turn that – to put it more informally than he does – objective concepts provide standards for which properties a fully realised concept would have. In the case of interest to us here, being member of a species *fully* involves necessarily having certain characteristics. But individuals can of course fall short of fully realising the concepts that constitute their essences in any number of different ways – and still be a member of that species. Ultimately, the full realisation of individuals of a particular species relies on there being a system of species – that is to say, of the objective concepts that structure nature.

There is much in Knappik’s view of Hegel’s essentialism that is consonant with the account we have given in the previous two chapters of Hegel’s earlier work; I broadly agree that the species provides a kind of ideal (embodied in actual individuals) whose realisation explains the characteristics an individual possesses as a member of that species. We will shortly address the crucial differences I see shortly. First, though, we will briefly look a reading of Hegel that claims to be diametrically opposed to Knappik’s.

⁴²⁸ Ereshefsky, ‘Species’, *Stanford Encyclopedia of Philosophy*.

⁴²⁹ Robert Stern, ‘Hegel, British Idealism, and the Curious Case of the Concrete Universal’, *British Journal for the History of Philosophy*, vol. 15 no. 1(2007), pp. 115 – 153.

⁴³⁰ Knappik, ‘Hegel’s Essentialism’, p. 769.

Recently it has become more common to read Hegel as an anti-essentialist, which would make him more palatable or amenable for contemporary revival, as Lindquist, for example, does. Lindquist opposes what he regards as the “consensus reading” of the genus (*Gattung*) section of the *Logic*, which reads it as primarily about reproduction. His opposition is partly because such readings can’t explain Hegel’s commitment to spontaneous generation, and partly that they overly focus on generational reproduction at a point in the logic where that is inappropriate.⁴³¹ He also opposes what he calls the “change reading”, which takes the section to be discussing diachronic identity, which the species of an individual is supposed to account for. He thinks that one issue with these past readings is an attempt to align Hegel with Aristotle, where ‘*Gattung*’ is a natural kind – and that the issue with this is that “Hegel’s categories explicitly overlap” whereas Aristotelian systems have dichotomous divisions of genus into species. Instead he proposes reading Hegel’s view of species ‘modally’, which he claims is a novel reading that begins “from the fact that we can recognise an organism only when we can see it within its environment”, and turns on the idea that “an organism is not required to live exactly how it lives, it could have behaved other than it in fact did while remaining the type of life-form that it is”.⁴³² The thrust of his reading seems to be that an individual’s species delimits the range of possible activities it can engage in, and that what it is to have a relation to a species is to have certain possible ways to act; the outcome, though, is that Lindquist thinks Hegel’s view of species is one where they are ultimately indeterminate. Rather than viewing the ‘powerlessness’ of nature as the ways an individual falls short of embodying a standard for its species as Knappik does, Lindquist sees it as follows: “because of the ‘weakness of nature’, there is no uniquely correct way to classify living beings, and any particular system we in fact settle on will only be what we find convenient for our purposes.”⁴³³ He accordingly refers to Hegel as a ‘species-constructivist’.

But I think that to read Hegel in this way would involve having to explain away many of Hegel’s comments that clearly refer to the universal essences of species when he is talking about organic nature. Lindquist’s objections to an Aristotelian reading of Hegel depend on a misconception of what the Aristotelian view involves; Aristotle himself, however, does not seem to have subscribed to the dichotomous approach.⁴³⁴ Taxonomy and essentialism can come apart – Hegel is, as we have seen opposed to taxonomy, and his essentialism is of a kind that avoids the shortcomings of a cruder ways of dividing up nature. I think the more important questions in this instance are what kind of scope the

⁴³¹ I do not think Hegel’s support for spontaneous generation is as clear-cut as Linquist suggests, and the pressure he feels not to prematurely introduce other individuals or even generations given the stages in the *Logic* he is primarily dealing with is not at all an issue in the material I am addressing. Accordingly, his main reasons for rejecting the ‘consensus reading’ do not seem to apply in this context.

⁴³² Lindquist, ‘On Origins and Species’, p. 431.

⁴³³ Lindquist, ‘On Origins and Species’, p. 439.

⁴³⁴ See, e.g., Pierre Pellegrin, *Aristotle’s Classification of Animals: Biology and the Conceptual Unity of the Aristotelian Corpus*, trans. Anthony Preus (Berkeley: University of California Press, 1986).

universal essences of species have (what level of specificity an essence works at – individual, species, or kingdom, for example), and what roles such an essence plays in the processes the individual engages in. In this respect, one point I want to emphasise in the period of Hegel we are concerned with is that The ‘impotence of nature’ Hegel talks of does not result in indeterminacy of species. There are indeed essences – ideals of a sort, although they must always be instantiated – which are not just a matter of ‘construction’ in response to the ‘impotence’ of nature. The impotence of nature is not a question of the species being indeterminate, but rather that the species must be made determinate by the individuals which make it up, and which do sometimes fall short of realising the species they instantiate – as we have seen in the previous chapters. Animals distinguish themselves as species, even if our practical attempts to classify and categorise them end up being insufficient in one way or another.

Disagreeing on this point with Lindquist does not mean we end up in the same place as Knappik, however. On Knappik’s reading of Hegel, reality is structured by objective concepts, which he claims Hegel uses more or less interchangeably with genera. If we grant, however, that i) our grasping of objective concepts must somehow be included in the content of what it is to be a particular objective concept, and ii) practically speaking our grasping of particular species depends on how the members of those species *distinguish themselves* from their environments and other individuals, then I think it is plausible to say that the individual members of a species themselves do not just instantiate the species as a universal, but contribute to the constitution of that species as a universal. Knappik points out that any particular objective concept requires the full system of objective concepts for its realisation;⁴³⁵ I believe the full realisation of any individual’s *Gattung* (i.e. objective concept) requires not only the entire system of genera (objective concepts), but also the individuals which express their species in apparently deficient ways.

The first point, i), goes deep into aspects of Hegel’s thought that cannot properly be addressed here, but seems plausible to me. Attributing to Hegel a view where species do not in some way take into account both their instantiations and their being cognised does not seem to capture what Hegel is driving at in the passages we have been examining (they certainly aren’t wholly free of our cognition of them, and simply having them be instantiated and inherent in individuals in a classic Aristotelian fashion isn’t enough to avoid that). The second point, ii), I think is clear from the reading of the *Phenomenology* of the previous section.

⁴³⁵ At least in order to avoid an explanatory regress; see Knappik, ‘Hegel’s Essentialism’, p. 775. He notes too that an objective concept or system of them needs ‘externality’, but I think individuals do not just embody such externality when they fall short of the objective concept, but contribute something more.

To summarise, then: as mentioned earlier, Knappik distinguishes helpfully between essentialism regarding individuals and essentialism regarding universals – species, in our case. Individuals do have an essence, for Hegel – their species is their essence, and their species unifies and directs their activities. But the species too has an essence; because, however, this essence also comes to be in the various ways individuals relate (including, but not exclusively, across generations), the individuals are more than just bearers of the essence.⁴³⁶ Such a reading of Hegel seems to me to be the best way to make sense of the various processes we have seen Hegel claim the individual and species are involved in.

Ultimately, that is why Hegel will later say that (so-called) “monsters” *‘have to be included in the genus, although they lack some of the characteristic determinations’*⁴³⁷: inclusion in the species is the key point here. I would suggest this is not just a question of our practices of dividing up the world – the monster itself expresses the species of which it is a member, and in so doing must be taken into account when working out what the essence of a species is. This does not mean – as will become even clearer in Hegel’s later work – that Hegel thinks that we need to change our species concepts in accordance with apparent exceptions (or any other individual). Even in the Jena period Hegel criticises geology for the “thoughtless” proliferation of new genera or species [*Gattungen, Arten*] wherever “a little difference” is found.⁴³⁸ For Hegel any changes across time could only be deviations from the essence of the species, and could never be significant enough to bring about a new species. Rather, essence of the species already takes into account deviations and variations, even those that might take place over the course of generations. It is not our reason which divides up nature into species, nor does nature simply fail to measure up to a set of pre-existing concepts aligned neatly with particular species. The individuals distinguish themselves into species, which can happen in various ways.

In comparison with Schelling, of course, the idealised essences of particular species play stronger roles for the early Hegel; such essences are not in any way the effect of forces of productivity and inhibition as they were for Schelling. It may sound almost paradoxical, but although for Hegel there is a greater sense of the existence of individuals as individuals, even in nature, they ultimately contribute less to the nature of the species of which they are members than they would for Schelling.

⁴³⁶ As I note below, this does not however mean that there is any significant change in the species over time, nor does it deny the priority of the ‘rule’ of the species over the individuals, although I do think Hegel in his early period is more likely to acknowledge the reasons for accommodating our species concepts to the characteristics of individuals than later Hegel, who is very explicit we should not do that. Even in the early Hegel, though, this doesn’t mean committing to a crude ad hoc form of empiricism.

⁴³⁷ PN I: §250 Addition, p. 216.

⁴³⁸ JS3, p.109.

Summary

The previous chapter outlined the various roles played by species in Hegel's Jena period, and it also addressed Hegel's view that the organic involves both individual-species processes and species-individual processes. In this chapter I have drawn out some of Hegel's critiques of taxonomic ideals and their philosophical motivations. One of the most important claims to be found in Hegel's criticisms of taxonomy develops such ideas: the suggestion that animals or groups of animals distinguish themselves from one another and inorganic nature (in some cases by means of their 'weapons'). I then moved on to address recent discussions about the essentialism Hegel subscribes to, suggesting that an alternative to two prominent strands of Hegel interpretation can be found by looking at Hegel's Jena period. For Hegel, I claimed, both species and individuals have essences; the essence of the individual is its species, and the essence of the species must take into account the activities of individuals.

In comparison with Schelling, of course, the essences of particular species seem to play stronger roles for the early Hegel; such essences are not as strongly framed as the result of forces of productivity and inhibition as they were for Schelling. For Hegel variation in individuals is primarily a matter of their falling short of a kind of ideal essence of the species (albeit an ideal essence which those individuals play a part in constituting). And in that sense, while Hegel may place greater emphasis on individuals as entities, Schelling's view of species is more able to take into account genuine variation and difference between individuals in a species. What might account for the different goals and approaches of Schelling and Hegel here? In the Schelling texts I focus on, the discussions of species occur, as I've tried to argue, in line with Schelling's focus on providing both an explanation of nature as *naturans* as *naturata*, and so species is treated 1) as a question of productive activity that is never a complete object and 2) thinking about the collection of individual productions. For Hegel, by contrast, my exegesis shows his concern with describing the cyclical activities and interactions of species with individual organisms. Hegel's work tends to emphasise boundaries between substances, and then discuss the interaction of substances, whereas Schelling seems to have more of a concern to explain the possibility of products out of his emphasis on activities themselves, which is a different priority.

CONCLUSIONS

My thesis has aimed to provide an outline of the distinctive accounts of species given by Kierkegaard, Schelling, and Hegel; it has aimed both to situate these accounts of species in the context of the wider thought of these thinkers and to illuminate the philosophical views more generally. Although each of these thinkers has a different view of species, and different views of the relation between species and individuals, I hope to have shown that they share a common core in their respective treatment of species: whilst they all aim to move beyond taxonomy as the major approach to issues of species, I have suggested that they all also consider what could be called 'organic' understandings of species or of the relation of species to individual.

For some prior thinkers the species of an individual could simply constitute the essence of an individual, dictating what it is like and what it can do; for other prior thinkers a species could be an abstraction to be read off the various characteristics of individuals. By contrast, the three thinkers considered here, in different ways, see species and individuals as constituting one another. In so doing, they look at the various processes where this takes place – sensation, reproduction, death, for example – and provide intricate accounts of these processes; the species of an individual (however species membership is ultimately spelled out) play key roles in those processes; likewise, the processes act out by individuals involve others of their species, other species, and nature itself – and even shape the species. Furthermore, their accounts of the organic world draw on, but move beyond earlier views of what it is to be organic.

I have also made more specific claims about each thinker.

Kierkegaard, I have claimed, takes a noncommittal metaphysical approach to the natural world, and provides an account of the balance of organic forces which is able to sustain great changes – even extinctions. I hope to have shown that although Schelling was at times enthusiastic about Kierkegaard's work, he downplays important parts of Kierkegaard's system.

The version of Schelling's account of species I have examined takes place in the context of what he calls a Spinozism of physics; I have argued that the implication of this is a conception of species in which a species is a particular stage in the unfolding of nature, fixed by sex difference, and which also in a particular way is constituted by the individuals that it in turn constitutes. And I have looked at this not only from a broader metaphysical perspective, but also from perspective of the embryonic development.

Schelling's view, I have claimed, is suited to taking into account variation within species, even if he is uninterested in genuine species transformation.

With respect to Hegel, I have discussed his understanding in the Jena period of species as the 'existent idea', the way that that plays out in various organic processes, and the way he distinguishes the plant and animal kingdoms. I have addressed his criticisms of the taxonomic approaches of his time, and based primarily on his claims about the ways animals distinguish themselves into species in the *Phenomenology*, provided an account of the particular kind of essentialism I think could be suggested by his earlier work.

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