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40. Jahrgang

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PETER LANG

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Peer Review: literatur für leser ist peer reviewed. Alle bei der Redaktion eingehenden Beiträge werden anonymisiert an alle Herausgeber weitergegeben und von allen begutachtet. Jeder Herausgeber hat ein Vetorecht.

Verlag und Anzeigenverwaltung: Peter Lang GmbH, Internationaler Verlag der Wissenschaften, Schlüterstrasse 42, 10707 Berlin,
Telefon: +49 (0) 30 232 567 900, Telefax +49 (0) 30 232 567 902

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Erscheinungsweise: 3mal jährlich
(März/Juli/November)

Bezugsbedingungen: Jahresabonnement EUR 54,95; Jahresabonnement für Studenten EUR 32,95;
Einzelheft EUR 26,95. Alle Preise verstehen sich zuzüglich Porto und Verpackung.
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“Beweglich und bildsam”: Goethe, Plants, and Literature

“Wo fass' ich dich, unendliche Natur?” Faust¹

Johann Wolfgang von Goethe's engagement with plants was a life-long pursuit, as he lays out in the essay *Der Verfasser teilt die Geschichte seiner botanischen Studien mit* (1817/1831). Written, as he explains in closing, to push back against the notion that his theory of morphology came to him in one brilliant flash of inspiration or unusual sagacity, the essay emphasizes his “folgerechtes Bemühen” (24:752), i.e. the persistent efforts of the author and gradual development of his theory of plant morphology over time. The narrative centers on themes that are paradigmatic for Goethe's natural scientific thinking as well as for the construction of knowledge around 1800, namely that 1) ideas such as morphology are to be understood in the context of the “Geschichte” or history/story of their coming into being, 2) are intimately bound up with their means and media of representation, and 3) arise as a sort of collaboration and unfinished process involving an active subject and dynamic object over time. In a strikingly modern conception of science, Goethe believed “die Geschichte der Wissenschaft [ist] die Wissenschaft selbst” (23:16), emphasizing that every idea develops and continues to exist in relation to a natural-scientific and cultural archive. It was also Goethe's conviction that knowledge cannot be transmitted in a finished state, but must be continually formed anew. The narrative documenting his time-bound pursuit of knowledge about plants can thus be understood as a way to share this process with readers in multiple senses of the word “mitteilen,” by encouraging them to become more receptive to vegetal life by vicariously following his development and relating it to their own experience.

Goethe's theory of plant forms is an alternative epistemology that aspires to train perception and cognition to be more receptive to the full scope of plant manifestations and develop “eine naturgemäße Darstellung,” a mode of representation in accordance with phenomena (24:448). Plants exert agency by shaping the subject's perceptual processes and the construction and presentation of knowledge. Based on a reading of several passages from the morphological notebooks that include essays written throughout Goethe's life as well as the elegy *Metamorphose der Pflanzen*, I will argue for the literary medium as a possible response to problems that a science (or philosophy) of plants can pose but not answer. In the first section, I will trace the development of Goethe's morphology and the alignment of thinking and seeing that it seeks to accomplish. I will outline the theory more fully in section II and examine how morphology is a way of looking at and thinking about plants that attempts to allow plants themselves to affect human thinking, making thinking itself multi-directional,

1 Johann Wolfgang Goethe: *Sämtliche Werke*. Frankfurt a.M.: Deutscher Klassiker Verlag 1994, vol. 7, p. 36. Citations from Goethe's complete works will hereafter be given in the text, written as volume and page number (e.g., 7:36).

processual, participatory, and lively. Section III will address the problem of representation posed by morphology as well as the role representation plays in it, both arising from the conundrum that the crucial transitions Goethe was interested in are not directly visible or representable in language. I will argue that literature and morphology share a common investment in expressing potentialities or possible states, a commonality which presents literature as a possible solution to morphology's representational challenge. Section IV brings together the other three sections in a reading of Goethe's elegy, which facilitates a form of observational participation through poetic means. It approaches the elusive double focus on thinking and seeing, or idea and experience, at the core of morphology and more generally of Goethe's approach to natural science.

I.

Throughout the Enlightenment the study of botany enjoyed a surge of interest on the part of scientists as well as the general public.² The young Goethe was not atypical in carrying around a copy of Carl Linnaeus' *Systema Naturae* as well as Johann Gessner's explanation of the former's terminological system with him everywhere he went in his early days in Weimar, from which he hoped to gain "mehr Aufklärung" and "eine allgemeinere Umsicht über dieses weite Reich" (24:737). This Enlightenment general overview of everything in the vast vegetal kingdom corresponds to Michel Foucault's characterization of the classical episteme as the age of natural history in which the visible constitutes the scope of the knowable, a visibility that could be transcribed into language by way of naming and description.³ Foucault suggests that the study of botany was so popular in this time because of its abundance of external surfaces in comparison to animals and humans, whose appreciation depended much more on understandings of internal function and causality.⁴ Anything complicating this immediate relation between the eye and discourse, such as internal mechanisms or the passage of time, was not apparent within the classical space of visibility, and thus "natural history" was understood less in a temporal sense but rather, like Linnaeus' taxonomy, more as a system of spatially organized relations, or even as an inventory of eternally existing and unchanging forms.⁵ Then, however, Immanuel Kant drove a wedge into the unproblematic relation between seeing and knowing by suggesting that humans cannot actually know the workings of natural organisms beyond the incidental observations we make of them, the sum of which is not equal to knowledge. For him, phenomena could be explained only through ordering individual perceptions into concepts, as the latter make up the discursive structure of knowledge. In the case of natural mechanisms, knowledge must necessarily always remain contingent

2 As Goethe remarks in his biographical narrative, his study of plants mirrors the development of botany as a whole (24:735). During his lifetime and amid the wide-sweeping reorganization of knowledge around 1800, it went from being a popular area of natural history to being its own autonomous field of scientific inquiry.

3 Michel Foucault: *The Order of Things. An Archaeology of the Human Sciences*. Translator not credited. New York: Vintage Books 1994, pp. 128-138.

4 *Ibid.*, p. 137.

5 *Ibid.*, pp. 130-131.

because, as Kant held, no telic causality could be ascribed to natural processes, since this would imply intentionality.⁶

Goethe soon found that he could no longer subscribe to Linnaeus' organizational matrix that attended to only one fixed aspect of the plant, the reproductive organs, and thus had little resemblance to empirical experience. Furthermore, the limits Kant had set around knowledge of the natural world – that we cannot empirically see concepts even though he does allow for such an intellectual intuition (*intellektuelle Anschauung*) in theory – seemed overly restrictive, especially since the philosopher himself seemed to have transgressed them in Goethe's estimation.⁷ Goethe disagreed with Kant's methodology precisely regarding the relation between knowing and perception. By starting with the idea and imposing that onto the natural world, Goethe thought, the scientist would inevitably encounter a disconnect between thinking and perception, between the broad theoretical category and the singularity of empirical observation.⁸ Such categories could not, for instance, account for botanical specificity, contingency, variation, and development, all of which seemed the more striking impressions of plant life for Goethe. In the essay on his botanical studies, he gives the example of variation according to geographical location, formulating a proto-theory of environmental adaptation:

Das Wechselhafte der Pflanzengestalten, dem ich längst auf seinem eigentümlichen Gange gefolgt, erweckte nun bei mir immermehr die Vorstellung: die uns umgebenden Pflanzenformen seien nicht ursprünglich determiniert und festgestellt, ihnen sei vielmehr, bei einer eigensinnigen, generischen und spezifischen Hartnäckigkeit, eine glückliche Mobilität und Biegsamkeit verliehen, um in so viele Bedingungen, die über dem Erdkreis auf sie einwirken, sich zu fügen und darnach bilden und umbilden zu können. (24:747-748)

Neither the taxonomical scheme nor the rationally-devised concept (as opposed to ideas based in empiricism) can account for variation within a category, which is an irritation that led Goethe to the search for a mode of thinking about plants drawn from the full range of their experience and only from that, in order to allow for the richness of similarity and difference within phenomena. In effect, Goethe sought a basis for the reintegration of knowing and seeing that would do justice both to the richness in variety of plant forms and the increasingly complex ways vision and perception were coming to be understood.

Goethe soon found himself drawn to alternative approaches to botanical organization, those that attended to the “fast unsichtbaren” (24:740) affinities between plant forms. He attributes Jean-Jacques Rousseau with the kernel of an idea he himself would see to fruition. The former, he writes, “mußte doch zur Vermutung gelangen, daß in dem unermeßlichen Pflanzenreiche keine so große Mannigfaltigkeit von Formen erscheinen könnte ohne daß ein Grundgesetz, es sei auch noch so verborgen, sie wieder sämtlich zur Einheit zurückbrächte” (24:742). He characterizes the

⁶ See Dalia Nassar: “Romantic Empiricism after the End of Nature.” In: *The Relevance of Romanticism: Essays on German Romantic Philosophy*. Ed. by Dalia Nassar. Oxford: Oxford University Press 2014, pp. 301-302; Robert J. Richards: *The Romantic Conception of Life. Science and Philosophy in the Age of Goethe*. Chicago: University of Chicago Press 2002, pp. 229-230.

⁷ Goethe suggests this in his essay *Anschauende Urteilskraft*, 24:447-448.

⁸ This disconnect between idea and phenomena is also the basis for Goethe's disagreement with the Kantian Friedrich Schiller, recounted famously in *Glückliches Ereignis*, 24:434-438. See also Eckart Förster: “Goethe and the ‘Auge des Geistes.’” In: *Deutsche Vierteljahrsschrift für Literaturwissenschaft und Geistesgeschichte* 75.1 (2001), pp. 87-101.

vegetal kingdom as “unermeßlich,” resisting rational measurement and calculability, and he notes elsewhere in the essay, “Trennen und Zählen lag nicht in meiner Natur” (24:739). In a similar gesture as Goethe’s own biographically-infused and time-bound accounts of his botanical studies, he suggests that Rousseau arrived at this idea of the unity-in-plurality of vegetal forms harkening back to one hidden principle only after “einem stürmischen Autor-Leben, auf der St. Peters-Insel, im Bielersee” (24:741). The realization came after his insular exile and significantly, a tumultuous life as an author, as if this temporal expanse of literary activity and life experience itself constituted a form of persistent effort that contributed to such a realization. In this understanding, botanical knowledge is, like its object, a product of gradual growth and development. Rather than constituting a smooth narrative of progress and building seamlessly onto what had come before, however, this lifetime of observation and literary effort make possible the break with a tradition that understood botany as an endlessly repeated set of names and fixed characteristics.⁹ Goethe’s formulation implies that this break is also facilitated in part through the type of thinking-in-possibilities that literature allows. Goethe is aware of his position on the cusp of a new era, and moreover thinks of himself and his contemporaries as seeds – nestled in auspicious intellectual ground and surrounded by a life-sustaining collective element that supports growth: “Wir sind jung mit der jungen Methode, unsre Anfänge treffen in eine neue Epoche, und wir werden in die Masse der Bestrebsamen wie in ein Element aufgenommen, das uns trägt und fördert” (24:744). There is an accord between the method itself and those who practice it (“wir sind jung mit der jungen Methode”), as if both forms of existence – as theory and as collective of researchers – were analogous modes of operation. The communal spirit in which these ideas were reached reappears in Goethe’s late writing projects, such as *Wilhelm Meisters Wanderjahre* as well as the morphological notebooks, conceived of as forms of collaborative work.¹⁰

II.

Goethe’s morphology is predicated on a conception of nature that is continuously in flux, and therefore evades being pinned down either as representation or even as concept. Goethe’s biblical epigraph to the first morphological notebook reads: “Siehe er geht vor mir über / ehe ich’s gewahr werde, / und verwandelt sich / ehe ich’s merke” (24:399). Elsewhere he characterizes this state of change: “Die Gestalt ist ein bewegliches, ein werdendes, ein vergehendes. Gestaltenlehre ist Verwandlungslehre”

⁹ In her examination of the heterogeneous form of Goethe’s morphological notebooks and his predilection for series as minimal organizational principle, Eva Geulen makes the case that Goethe was more concerned with maintaining discontinuity and unarticulated relationships than with utilizing narrative to form phenomena into over-hasty continuities and tidy progression (“Serialization in Goethe’s Morphology.” In: *Compar(a)ison. Comparative Epistemologies of Literature 2* (2016), pp. 53-70). While Goethe’s narrative of his botanical studies stands out as one of the more formally coherent and ordered texts within the hodgepodge of the notebooks, the essay itself comes in two different iterations. Remarkable differences include a shift in the title and opening narrative from first to third person, the pluralization of “Studien” and the new idea of “Mitteilung,” literally staging an expanding scope and shifting perspective away from the self (see *Geschichte meines botanischen Studiums*, 1817).

¹⁰ Safia Azzouni examines this collaborative and curatorial conception of authorship in the late works in detail in *Kunst als praktische Wissenschaft. Goethes ‘Wilhelm Meisters Wanderjahre’ und die Hefte ‘Zur Morphologie.’* Cologne: Böhlau 2005, pp. 33-35 a. 38-39.

(24:349). As such, the all-encompassing idea or law that is derived from observing this perpetual transformation must also contain the fleeting and transitory as its constitutive principle, in order to avoid stultifying the process it describes or separating and abstracting itself away from it. The development that the idea of morphology undergoes over the course of Goethe's life is suggested in the changing terminology he uses to describe what began as the *Urpflanze*, then developed into *Urbild*, *Typus*, or *Urphänomen*.¹¹ These terms, along with the hypothesis "Alles ist Blatt," demarcate variations on the idea that all plant forms are related to one another, since they are expressions of one basic form (24:84). Morphology is the art of recognizing this unity within the endless diversity as well as contemplating and mentally tracing how this common idea expresses itself in the empirical examples.¹² Goethe implies that this study of forms facilitates a certain readability of nature – "Die Lehre der Metamorphose ist der Schlüssel zu allen Zeichen der Natur" (24:349) – even though the recognition that constitutes morphology is non-discursive.

Goethe continually stresses that the theory that ties together these disparate phenomena lies in the phenomena themselves and not somehow prior to them or behind them. While Goethe's idea of the *Urpflanze* would seem to imply Platonism, it is rather an order of intelligibility that does not predate experience and constantly stands to be modified by it. The *Urpflanze* thus has something in common with the Greek *theoria*, translated in Goethe's day as *Anschaung*, a level of slight generalization that, however, remains entirely perceptible to the eye, without the extensive abstraction and disconnect from the empirical level of the modern idea of "theory." In this sense, *Anschaung* is a mediation between the thinking, perceiving subject and its object, and is itself something Goethe considered a form of thinking: "daß mein Denken sich von den Gegenständen nicht sondere, daß die Elemente der Gegenstände, die Anschauungen in dasselbe eingehen und von ihm auf das innigste durchdrungen werden, daß mein Anschauen selbst ein Denken, mein Denken ein Anschauen sei" (24:595). Thinking and visual contemplation are not separated from each other, but intricately connected. Such a combination of thinking and perceiving avoids the pitfalls of either purely abstract thought or purely empirical experience, both of which separate the general from the specific or the synthesis of all plants from any individual example. In both cases, the problem is that one objectifies and stultifies the plant (as discrete example or as general category), separating it from the dynamism of its unfurling and thus, in a sense, from its very life. If, on the other hand, the balance between empiricism and cognitive synthesis is achieved, science itself is endowed with life and breath, as Goethe implies: "Ein Jahrhundert, das sich bloß auf die Analyse verlegt, und sich vor der Synthese gleichsam fürchtet, ist nicht auf dem rechten Wege; denn

11 For a discussion of the differences between these terms see Jonas Maatsch: *Naturgeschichte der Philospheme. Frühromantische Wissensordnungen im Kontext*. Heidelberg: Winter 2008, pp. 91-94. Goethe eventually reached the conclusion that the "leaf" of his hypothesis "Alles ist Blatt" was insufficient as the single descriptor implied by the dictum, at which point he turned toward more lengthy descriptions of transitions. See Michael Bies: *Im Grunde ein Bild. Die Darstellung der Naturforschung bei Kant, Goethe und Alexander von Humboldt*. Göttingen: Wallstein 2012, pp. 171-172.

12 Goethe envisioned his morphology as becoming a "new science," though it never reached that point (see his essay *Betrachtung über Morphologie überhaupt*, 24:364-369; Geulen: "Serialization," pp. 53-54). Likely in light of the ensuing terminological difficulty, Jonas Maatsch calls Goethe's morphological procedure an art in his introduction to *Morphologie und Moderne. Goethes 'anschauliches Denken' in den Geistes- und Kulturwissenschaften seit 1800*. Ed. by *ibid.* Berlin: De Gruyter 2014, pp. 1-15, here p. 2.

nur beide zusammen, wie Aus- und Einatmen, machen das Leben der Wissenschaft" (25:84).¹³

Given the close connection between the object of the gaze and perception itself, it follows that allowing one side – the plant world – to show itself in all its liveliness also has implications for the other side, its visual contemplation. This perhaps accounts for the striking agency in Goethe's formulation in the essay on his botanical studies: "Hier drang sich nun dem unmittelbaren Anschauen gewaltig auf: wie jede Pflanze ihre Gelegenheit sucht, wie sie eine Lage fordert wo sie in Fülle und Freiheit erscheinen könne" (24:746). The practice of direct viewing asserts itself "powerfully," even "violently" on the subject. In a letter to Charlotte von Stein, the plants themselves exert agency on his mind: "Das Pflanzenreich raßt einmal wieder in meinem Gemüthe, ich kann es nicht einen Augenblick loswerden" (9.-10.7.1786, 29:637). The plasticity of thinking necessary in order to grasp nature in all its complexity is made possible by an alignment of the viewer to the object viewed: "Das Gebildete wird sogleich wieder umgebildet, und wir haben uns, wenn wir einigermaßen zum lebendigen Anschauen der Natur gelangen wollen, selbst so beweglich und bildsam zu erhalten, nach dem Beispiele mit dem sie uns vorgeht" (24:392). The epistemological consequences of this are significant, as Dalia Nassar formulates: "knowledge involves the attempt to become identical with the thing known,"¹⁴ or in Goethe's own words from *Maximen und Reflexionen*, "Es gibt eine zarte Empirie, die sich mit dem Gegenstand innigst identisch macht, und dadurch zur eigentlichen Theorie wird" (13:149). Thus, to observe plants and really understand them necessitates an openness in the viewer to undergo a transformation through involvement with them. Goethe does not understate the transformative process: "Nimm jetzt das *Haften* an Einer Form, unter *allen* Lichtern, so wird dir dieses Ding immer lebendiger, wahrer, runder, es wird endlich du selbst werden" (18:180, emphasis in the original).¹⁵ To start this sequence, a change in thinking is necessary in the observer in order to allow ideas to emerge from that which is observed, rather than imposing them on phenomena.¹⁶ According to Goethe, ideas should be achieved through active involvement and empirical investigation and are subject to continual reassessment and modification in dialogue with the empirical world.¹⁷ For the researcher, it becomes a practice and involves continual self-assessment. The "result" is not a fixed theory, but a form of knowing that opens itself up to the agency and dynamism of plants themselves.

13 Goethe also counted persistent effort and activity among the aspects of a science that can be "alive": "Jedes reine Bemühen ist auch ein Lebendiges, Zweck sein selbst, fördernd ohne Ziel, nützend wie man es nicht voraussehen konnte" (24:485, emphasis in the original). As Geulen points out in "Serialization," p. 54, his valuation of persistent effort is his most enduring methodological constant.

14 Nassar, "Romantic Empiricism," p. 307.

15 David Wellbery calls this "Subjekt-Objekt-Identität im Phänomen" or "spontane Rezeptivität" ("Form und Idee. Skizze eines Begriffsfeldes um 1800." In: Maatsch (ed.): *Morphologie und Moderne*, pp. 17-42, here p. 22).

16 Frederick Amrine emphasizes that this openness to phenomena is especially important considering that one's way of seeing ("theorizing" in a literal sense) co-creates the thing seen for Goethe ("The Metamorphosis of the Scientist." In: *Goethe Yearbook* 5 (1990), pp. 187-212, here p. 194).

17 Nassar suggests an ethical potential in the falling-together of the epistemological act and ontological reality, specifically in this willingness on the part of the observer to undergo a transformation in gaining knowledge ("Romantic Empiricism," pp. 310-311).

III.

In several passages throughout his writings on morphology, Goethe gestures toward the problem of representation, and many of his texts deal with it outright. Morphology poses a significant challenge to representation, while also depending on it and involving it at key points. On the one hand, depicting these natural processes is intimately connected to the idea of morphology, since one must actively conjure up an image of the plant's development in the mind. In the notebooks, Goethe articulates the primary goal of his "new science" as representing rather than explaining phenomena: "Da sie [die Morphologie] nur darstellen und nicht erklären will" (24:364). This means that its epistemic claim as a science exists in and as representation, and that depicting something can be used as a method of gaining knowledge about it.¹⁸ On the other hand, representation carries with it the danger of cutting off and "freezing" its object – "durch das Wort zu töten" (23:245) – whether as closed-off work of art or discrete idea. The reason why it is important to try to align thinking and perception is because these transitions between plant forms cannot actually be perceived by the physical senses, and taking one image or impression as the complete view misses the key changes. The imperative of representation thus springs from its impossibility, both in language and in perception itself. This section will consider how language and literature stage the process of botanical growth and development, spanning the gap between idea and phenomena and thus constituting a significant part of the theory of morphology itself.

Within the effort not to impose pre-formed concepts onto nature, the choice of words with which to speak and write about this scientific project is crucial. Among Goethe's writings on aesthetics there are very few direct engagements with the problem of language, but his natural-scientific writing is continuously concerned with the challenges of formulating his ideas in words and with the relationship of language to the objects he wishes to describe.¹⁹ It is in the scientific texts, rather than in the literary works or the aesthetic writings, that one can recognize a more developed critique of language. In particular, there is a concern about how scientific terminology presents its object as a finished and unchanging concept, abstracted away from the life it seeks to describe, rather than showing changes of state and fluid borders. Given the crucial role of representation in forming the scientific object, using a single word makes the object of study singular and discrete as well. For this reason, Goethe avoids using conventional scientific terms and instead develops a series of words in order to continually open up alternative perspectives on the phenomenon at hand.²⁰

18 The central role of representation places morphology in the context of Joseph Vogl's concept of poeologies of knowledge, in which "die Herstellung von Wissensobjekten und Aussagen unmittelbar mit der Frage nach deren Inszenierung und Darstellbarkeit verknüpft [sind]" (*Poeologien des Wissens um 1800*. Munich: Fink 1999, p. 7.).

19 See Uwe Pörksen: "Alles ist Blatt." Über Reichweite und Grenzen der naturwissenschaftlichen Sprache und Darstellungsweise Goethes." In: *Berichte zur Wissenschaftsgeschichte* 11 (1988), pp. 133-148, here p. 135; Bies: *Im Grunde ein Bild*, p. 161.

20 Pörksen, "Alles ist Blatt," pp. 138-140. Goethe's attempt to build a series of terms is analogous to his recommended construction of a series of experiments (rather than just undertaking one or two, which will likely misrepresent phenomena). This method of "Reihenbildung" underlies his scientific approach in general. See Geulen: "Serialization," pp. 53-70. In expressing his disappointment at the cool reception he repeatedly received for his morphological writings, Goethe specifically names the "Fasslichkeit" of his ideas and the accessible use of

Beyond the problem of terminology, the words to describe the movements of expansion and contraction that for Goethe constitute a plant's development also inevitably flatten some of the variability of its manifestations, leading him to consider algebraic formulations despite his aversion to abstraction:

Besser wäre es ihr ein x oder y nach algebraischer Weise zu geben, denn die Worte Ausdehnung und Zusammenziehung drücken diese Wirkung nicht in ihrem ganzen Umfange aus. Sie zieht zusammen, dehnt aus, bildet aus, bildet um, verbindet, sondert, färbt, entfärbt, verbreitet, verlängert, erweicht, verhärtet, teilt mit, entzieht und nur allein, wenn wir alle ihre verschiedenen Wirkungen in Einem sehen dann können wir das anschaulicher kennen was ich durch diese vielen Worte zu erklären und auseinander zu setzen gedacht habe. (24:101-102)²¹

The actions connected to the string of verbs must be thought simultaneously as possible expressions and in time as empirical manifestations in order to get the right impression, making the words themselves seem more of a hindrance than a facilitator to understanding. Here one recognizes a clear difference from the classical age, in which a single naming word summed up a timeless view of the object.²² In the context of Goethe's early attempts to communicate his morphological ideas during his second trip to Italy, he seems skeptical about expressing them in language, even under the best of conditions: "Doch auf alle Fälle ist's schwer zu schreiben, und unmöglich aus dem bloßen Lesen zu begreifen, wenn auch alles noch so eigentlich und scharf geschrieben wäre" (15:429).²³ To overcome this challenge, Goethe emphasizes again the importance of aligning ourselves and our verbal expression with the dynamism of the processes to be shown:

Betrachten wir aber alle Gestalten, besonders die organischen, so finden wir, daß nirgend ein Bestehendes, nirgend ein Ruhendes, ein Abgeschlossenes vorkommt, sondern daß vielmehr alles in einer steten Bewegung schwankt. Daher unsere Sprache das Wort Bildung sowohl von dem Hervorgebrachten, als von dem Hervorgebrachtwerdenden gehörig genug zu brauchen pflegt. Wollen wir also eine Morphologie einleiten, so dürfen wir nicht von Gestalt sprechen; sondern wenn wir das Wort brauchen, uns allenfalls dabei nur die Idee, den Begriff oder ein in der Erfahrung nur für den Augenblick Festgehaltenes denken. (24:392)

Even though the challenge in this passage involves how to describe the unfolding process in language, it is not formulated in terms of representation, but as "introducing," "inducing," or "bringing into being" (*einleiten*) morphology itself. Since morphology involves recognizing something present but not directly perceivable, language can intervene in that process by concretizing a moment of becoming that exists as a potential logical consequence of what appears to the physical eye as an unchanging

language as reasons he thought his works would be embraced, but as he repeatedly must learn, "zu meiner Art mich auszudrücken wollte sich niemand bequemen" (24:423). Geulen furthermore emphasizes Goethe's hesitant use of language, such as the frequent particles "gleichsam," "vielleicht," and "kaum," which indicate his attempts at avoiding "dogmatische[] Vereindeutigung." "Urpflanze (und Goethes *Hefte zur Morphologie*)." In: *Unworte: Zur Geschichte und Funktion erstbegründender Begriffe*. Ed. by Michael Ott a. Tobias Döring. Munich: Fink 2012, pp. 155-171; here p. 158.

21 Today, there is a research group devoted to Algorithmic Botany at the University of Calgary. URL: <http://algorithmicbotany.org/> [last accessed on 10 November 2018].

22 Foucault: *Order of Things*, p. 130.

23 The incommunicability of knowledge is a theme throughout Goethe's scientific writings, stemming from his conviction that scientific work needs to be carried out personally in order to be understood. Rhetorical gestures drawing on common experience ("wir," etc.) appear frequently, as do attempts to facilitate forms of practice, such as the series of experiments the reader is encouraged to undertake in *Die Farbenlehre*. See Amrine: "Metamorphosis," pp. 198-201.

state. Rather than “Gestalt,” which implies a finished and discrete form, Goethe thus prefers the ambiguous “Bildung” to suggest both the form and the process by which it came about and continues to develop.²⁴

Retaining the focus on the dynamism of plant life brings a further challenge: morphology involves a necessary temporality to show development, and there should be an understanding that a concrete form only represents one moment in that development, but it simultaneously contains the rest of this progression as potential. This apparent paradox resides in a larger issue related to Goethe’s disagreement with Kant, namely that the whole, or here the “idea,” is atemporal, but our experience is always bound to space and time:

die Idee ist unabhängig von Raum und Zeit, die Naturforschung ist in Raum und Zeit beschränkt, daher ist in der Idee Simultanes und Sukzessives innigst verbunden, auf dem Standpunkt der Erfahrung hingegen immer getrennt, und eine Naturwirkung die wir der Idee gemäß als simultan und sukzessiv zugleich denken sollen, scheint uns in eine Art Wahnsinn zu versetzen. (*Bedenken und Ergebung*, 24:449)

The difficulty of thinking simultaneity and succession as intertwined, even though they appear as discrete from each other in our experience, is thus not merely a problem with language. It exemplifies the gap that remains between idea and experience,²⁵ which is inescapable under normal (direct) perception. In the essay *Bedenken und Ergebung*, Goethe muses that Kant (who remains unnamed but is strongly evoked) may have been right all along when he writes that the practical difference between perception and concept appears to be an unbridgeable chasm particularly for natural science. Elsewhere Goethe navigates this aporia by conceiving of *Anschauung* as containing imagination and memory in order to facilitate a true understanding of how individual phenomena fit into a notion of the whole. Such a circuitous route that necessitates the transformation of direct perception through the mind and imagination is thus, for Goethe, a more realistic and accurate representation of nature.²⁶

This mediated understanding of realistic representation of morphology, which must first be transformed in the imagination before truly reflecting its object, invites a connection to art and literature that Goethe considered so self-evident that he need not elaborate further:

die lebendigen Bildungen als solche zu erkennen, ihre äußern sichtbaren, greiflichen Teile im Zusammenhänge zu erfassen, sie als Andeutungen des Innern aufzunehmen und so das Ganze in der Anschauung gewissermaßen zu beherrschen. Wie nah dieses wissenschaftliche Verlangen mit dem Kunst- und Nachahmungstribe zusammenhänge, braucht wohl nicht umständlich ausgeführt zu werden. (24:391)

This “scientific desire” is very close to art and the “mimetic drive,” a disciplinary overlay which furthermore might help unify the dizzying double focus on temporalized perception and atemporal concept, empirical part and ideal whole, making intellectual intuition

²⁴ This idea can be found at various points across Goethe’s oeuvre in relation to the issue of representation itself, namely that the sole focus on the finished representation, without taking into consideration the conditions in which it came about and continues to develop, leads to stultifying, deathly images. See for example Fritz Breithaupt: *Jenseits der Bilder: Goethes Politik der Wahrnehmung*. Freiburg i.Br.: Rombach 2000.

²⁵ Goethe writes in *Bedenken und Ergebung*, “[dass] zwischen Idee und Erfahrung eine gewisse Kluft befestigt scheint” (24:449).

²⁶ Along these lines, Nassar emphasizes that Goethe’s idealism does not imply antirealism (“Romantic Empiricism,” p. 310).

more achievable. In the same passage of *Bedenken und Ergebung* discussed above, right after raising the specter of *Wahnsinn* arising from the elusive but necessary alignment of idea and experience, Goethe flees to poetry: “Deshalb wir uns denn billig zu einiger Befriedigung in die Sphäre der Dichtkunst flüchten ...” (24:450). The poem that he recites begins:

So schauet mit bescheidnem Blick
Der ewigen Weberin Meisterstück,
Wie ein Tritt tausend Fäden regt,
Die Schifflein hinüber herüber schießen,
Die Fäden sich beegnend fließen,
Ein Schlag tausend Verbindungen schlägt.

This is apparently a reflection on the appropriately humble attitude toward viewing, and the way part and whole hang together. It is an image of total movement and thoroughgoing causality, and it also references literature through the common metaphor of threads and weaving. Rather than serving as escape, then, literature becomes an analogy to morphology by providing the double image of both observed object and process through which this object comes about. As I will argue in more detail below based on a reading of the elegy *Metamorphose der Pflanzen*, poetry can serve as a simulation of intellectual intuition and a heuristic in achieving its elusive unity.

The close proximity between poetry and morphology began in the gardens of Palermo during Goethe's first trip to Italy in 1787, where he thought to give himself over entirely to his poetic pursuits, which included reading Homer and writing his *Nausikaa* tragedy, but he found himself haunted by the idea of the *Urpflanze*:

Heute früh ging ich mit dem festen, ruhigen Vorsatz meine dichterischen Träume fortzusetzen nach dem öffentlichen Garten, allein, eh ich mich versah, erhaschte mich ein anderes Gespenst, das mir schon diese Tage nachgeschlichen. [...] ob ich nicht unter dieser Schar die Urpflanze entdecken könnte? (17.4.1787, 15:285-286)

Despite his later insistence that his “guter poetischer Vorsatz” was ruined by his botanical activity, the way this ghost of his scientific pursuits appears suggests that it is his poetic frame of mind that made him susceptible to these thoughts. He expresses a similar connection in a letter to Charlotte von Stein two months later, in which he describes the ability of his idea of the *Urpflanze* to produce an endless string of plants. Even though these imagined plants do not exist in actuality, each is endowed with its own claim to truth and necessity, which he contrasts with painterly and poetic “shades” and “illusions”:

Sage Herdern daß ich dem Geheimnis der Pflanzenzeugung und Organisation ganz nah bin und daß es das einfachste ist was nur gedacht werden kann. [...] Mit diesem Modell und dem Schlüssel dazu, kann man alsdann noch Pflanzen ins unendliche erfinden, die konsequent seyn müßen, das heißt: die, wenn sie auch nicht existieren, doch existieren könnten und nicht etwa mahlerische oder dichterische Schatten und Scheine sind, sondern eine innerliche Wahrheit und Nothwendigkeit haben. (8.6.1787, 30:305)

Goethe mentions painting and literature in close proximity to the hypothetical vegetal proliferation, and despite the surface-level opposition between poetry and truth (and here more specifically, poetry and plants) in this passage, the formulation itself leaves the door open to crucial parallels between them. The specification of “Schatten und Scheine” might imply that he is isolating merely those problematic appearances and

not the artistic forms themselves. Moreover, poetic shades and illusions semantically merge with the ghost of the *Urpflanze* from the Palermo visit, suggesting that spectrality haunts both literature and science.²⁷ These plants are “Erfindungen,” creations that are true-to-life but which do not actually exist in nature and so are *poietic* in the sense of being made. Goethe’s language is strikingly similar to Aristotle’s *Poetics*, when, also based in a reading of Homer, he distinguishes between the poet and the history writer: “es [ist] nicht Aufgabe des Dichters [...] mitzuteilen, was wirklich geschehen ist, sondern vielmehr, was geschehen könnte, d.h. das nach den Regeln der Wahrscheinlichkeit oder Notwendigkeit Mögliche.”²⁸ Poetry, by which Aristotle means literature more generally, is a creative reproduction not of what is, but of what could be, according to the laws of probability or likelihood. To think the universal from the particular is moreover a creative effort of the intellect and the imagination for Aristotle, and thus a form of poetic truth arises from the idealized “essence” rather than appearances or “Scheine.” I suggest that poetry as the realm of potentialities overlaps significantly with Goethe’s thinking of the *Urpflanze*, summarized as “nicht eine Natur, die aktuell an einem bestimmten Ort und unter bestimmten Umständen zu ergründen wäre, sondern die Fülle der ihr möglichen Ausprägungen, also das latente Potential an Formen und damit weniger die Frage, wie die Natur tatsächlich ist, sondern vielmehr die Frage, wie sie denn sein könnte.”²⁹ The *Urpflanze*, like literature, deals in potentialities, in options or possible states of being rather than in concrete actualities, and its epistemological claim is based on these as well.

IV.

The theoretical proximity between poetry and morphology finds its literary expression in the 1798 elegy *Metamorphose der Pflanzen*. It presents in poetic form many of the central ideas of the 1790 prose essay *Versuch die Metamorphose der Pflanzen zu erklären*, Goethe’s first published work on the topic. Written as a love poem and addressed to an explicitly female audience (“Dich verwirret, Geliebte”), the elegy is a renewed attempt to gain the recognition the first work lacked. It also shows the worlds of science and poetry to be intertwined despite the “Umschwung von Zeiten”³⁰ around 1800, during which disciplines were increasingly drifting apart. The poem is typically read as an attempt to promote and popularize Goethe’s morphological ideas among a non-specialist and female audience, as a reflection on the relation of literature to

27 Based on an examination of Goethe’s statements in *Die Farbenlehre* and elsewhere, Chad Wellmon suggests that spectrality is a characteristic of scientific ideas in general, since contextualizing them appropriately in their historical and discursive environment means that they are always haunted by past practice (“Goethe’s Morphology of Knowledge, or the Overgrowth of Nomenclature.” In: *Goethe Yearbook* 17 (2010), 153-177, here p. 171.)

28 Aristoteles: *Poetik. Griechisch/Deutsch*. Ed. a. transl. by Manfred Fuhrmann. Stuttgart: Reclam 1982, p. 29.

29 Benjamin Bühler a. Stefan Rieger: *Das Wuchern der Pflanzen. Ein Florilegium des Wissens*. Frankfurt a.M.: Suhrkamp 2009, p. 250.

30 These are Goethe’s words from an essay in the first *Heft zur Morphologie* (1817) entitled *Schicksal der Druckschrift*, which directly preceded the reprint of the elegy: “nirgends wollte man zugeben, daß Wissenschaft und Poesie vereinbar seien. Man vergaß daß Wissenschaft sich aus Poesie entwickelt habe, man bedachte nicht daß, nach einem Umschwung von Zeiten, beide sich wieder freundlich, zu beiderseitigem Vorteil, auf höherer Stelle, gar wohl wieder begegnen könnten” (24:420). Because it appears in the morphological notebooks among the other essays I have examined here, I will be citing this version of the poem, which has a few slight variations from the first version published in Schiller’s *Musen Almanach* in 1798.

science and how literature can further scientific aims, and as a metaphor for his relationship with his common-law wife, Christiane Vulpius.³¹ My analysis focuses on the positioning of language in the poem in relation to temporality and the form of experience that it seeks to facilitate.

The gendered addressee of the poem can partly be understood in the tradition of Rousseau's 1771 *Lettres élémentaires sur la botanique*, an epistolary work addressed to his female cousin and written to educate women in botany.³² It appeared in German as *Botanik für Frauenzimmer* in 1781 and was quite popular throughout Europe. In his autobiographical narrative, Goethe praises the work without naming it directly (though the original publication date is given). He particularly admires how Rousseau sought to impart knowledge of the entire science to his female audience rather than just giving a superficial impression: "was er weiß und einsieht Frauen vorzutragen, nicht etwa zu spielender Unterhaltung, sondern sie gründlich in die Wissenschaft einzuleiten" (24:742). He sees an affinity to his own method in Rousseau's progression from the particularity of each part to an overview of the whole, the variability of which can only be appreciated with an understanding of both:

er legt die Pflanzenteile einzeln vor, lehrt sie unterscheiden und benennen. Kaum aber hat er hierauf die ganze Blume aus den Teilen wieder hergestellt [...] so gibt er alsobald eine breitere Übersicht ganzer Massen. [...] und indem er auf diesem Wege die Unterschiede in steigender Mannigfaltigkeit und Verschränkung anschaulich macht, führt er uns unmerklich einer vollständigen erfreulichen Übersicht entgegen. (24:742-743)

In general the theme of how botany as a science can benefit from the engagement of a non-specialist audience is strong throughout Goethe's autobiographical narrative, since for the uninitiated botany must be grounded in empirical experience and intuitive knowledge. Goethe counts both himself and Rousseau among these "Dilettanten" (24:743).

In the opening lines of the elegy, the male voice³³ gestures toward the diversity of forms, the "Blumengewühl[]" that had flustered his female companion. With a critical side-glance at Linnaean taxonomy, he suggests that it is specifically the many plant names that have confused her. What should have been systematically separated and categorized appears as an undifferentiated and vertiginous mass of plant life. However, he also laments not having "the word" that could act as key to comprehending this vegetal proliferation:

Alle Gestalten sind ähnlich, und keine gleicht der andern;
Und so deutet das Chor auf ein geheimes Gesetz,
Auf ein heiliges Rätsel. O könnt ich dir, liebliche Freundin,
Überliefern sogleich glücklich das lösende Wort! - (24:420-421)

31 For a more detailed discussion of the issue of gender in the elegy, see for example Jocelyn Holland: *German Romanticism and Science. The Procreative Poetics of Goethe, Novalis, and Ritter*. New York: Routledge 2009, pp. 19-55; Michael Bies: "Staging Knowledge of Plants. Goethe's Elegy 'The Metamorphosis of Plants.'" In: *Performing Knowledge 1750-1850*. Ed. by Mary Helen Dupree a. Sean B. Franzel. Berlin: de Gruyter 2015, pp. 247-267.

32 For a discussion of how Rousseau's text disseminated botanical knowledge via the popular literary form of the sentimental letter, see Bies: "Staging Knowledge," pp. 254-257.

33 Due to the autobiographical connection and the implication of (hetero)sexual reproduction near the end of the poem, it is typically read as narrated by a man (cf. Holland: *German Romanticism and Science*, p. 42, elsewhere). I will follow this convention, although it could be seen as ambiguous in the poem itself.

All forms apparently harken back to a common principle, but it becomes evident in the course of the following description of the symbolic plant that the observer's eventual understanding hinges precisely on the narrator's inability to provide one single word to describe it. Similar to Goethe's avoidance of fixed terminology in favor of a series of descriptive terms that develop on and modify each other, many words and the passing of time are necessary to make the object evident (rather than this happening "sogleich"). Although indirect, "[ü]berliefern sogleich [...] das lösende Wort" could be read as another critique of the classical, taxonomical system that, in naming, presents one atemporal aspect of the plant. Instead, the temporal span of plant life and its understanding are mirrored in the formal characteristic of the elegy as a relatively long form of lyric poetry, incorporating a series of words rather than a single, potentially "deadly" one.³⁴ Elegies are traditionally expressions of admiration, didactic works, or erotic poems, all three of which are true for Goethe's *Metamorphose der Pflanzen*, and all share a common requirement of unfolding over time.³⁵ The expansion and contraction of the elegiac couplets (alternating lines of hexameter and pentameter) formally express the movements of *Ausdehnung* and *Zusammenziehung* that the narrator describes on the thematic level.³⁶ These movements, along with the temporalized development that can be understood as intensification or *Steigerung*, formally express the crucial movements that morphology traces. The rhythm helps bring back together into one dynamic image the various parts of the plant described in "diese[n] vielen Worte[n]," which Goethe in his essayistic writing had worried would splinter the view and which led him to consider algebraic formulas to express variability (24:102).³⁷

Language is deemed insufficient to deliver the spontaneous image of plant life in a single word, but instead, it stages a time-bound process of visual perception in which the observer learns how to recognize plant forms for herself. Akin to the rhetorical tradition of *enargeia* or vivid presentation, the language of the poem seeks to facilitate visual experience via the active imagination, as it presents the developing plant for visual contemplation. In Quintilian's words, "*enargeia* makes us seem not so much to narrate as to exhibit the actual scene."³⁸ At the same time, what is exhibited in this case includes a view into processes that are not normally visible to the physical eye, such as the activity that takes place within a plant's seed, below the soil:

34 Cf. "durch das Wort zu töten" (23:245).

35 In *Über naive und sentimentalische Dichtung*, Schiller addresses the problem of didactic poetry, since it clearly has an aim other than aesthetic, which compromises its autonomy as art. According to Schiller, the only way around this problem is to treat the knowledge to be communicated in a truly aesthetic way, thus elevating it to a form of aesthetically mediated intellectual intuition. However, reminiscent of Kant, Schiller doubts that this would be possible in practice, asserting that he has never seen such a poem. Friedrich Schiller: *Werke und Briefe in zwölf Bänden*. Ed. by Georg Kurscheidt. Frankfurt a.M.: Deutscher Klassiker Verlag 1988, vol. 8, pp. 706-810. See also Bies: "Staging Knowledge," p. 259.

36 Schiller famously summed up the formal movement of the elegiac couplet or *Distichon*: "Im Hexameter steigt des Springquells flüssige Säule / Im Pentameter drauf fällt sie melodisch herab." Schiller: *Werke und Briefe*, vol. 1, p. 283.

37 Poetic rhythm is an important aspect of Friedrich Gottlieb Klopstock's theory of *Darstellung* or dynamic presentation, which was influential starting in the 1770s. *Darstellung* strives to find a formal equivalence to the 'life' it seeks to portray and also to 'enliven' its listener with a form of direct experience (in contrast to cumbersome descriptions). For a discussion of *Darstellung* in relation to Goethe's elegy, see Bies: "Staging Knowledge," pp. 261-263.

38 Marcus Fabius Quintilianus: *The Institutio Oratoria of Quintilian*. Transl. by H.E. Butler. Cambridge: Harvard University Press 1920, 2.VI.ii.32.

Einfach schlief in dem Samen die Kraft; ein beginnendes Vorbild
Lag, verschlossen in sich, unter die Hülle gebeugt,
Blatt und Wurzel und Keim, nur halb geformt und farblos;
Trocken erhält so der Kern ruhiges Leben bewahrt (24:421)

Poetic language gives access to an impossible empirical view, the potential plant contained in the seed as well as the life cycle of a discrete plant among the burgeoning growth of the garden. As such, the text trains the mind's eye to see these otherwise invisible states, while offering an image that the poetic presentation makes available to the senses. In this way, the form and content of these poetic views bring together thinking and perception. Rather than giving a single snapshot, the poem offers a temporalized gaze that follows the stages of plant development and focuses on its transitions and transformations. The poem expands the view across time in order to capture plant dynamism, while simultaneously compressing the time these transitions would actually take. It thus approaches the double view of simultaneity and succession that Goethe found so crucial yet elusive in natural science.

In examining the poem, it becomes clearer how (literary) language itself "induces" a metamorphosis by bringing it about under the gaze. If one considers the movement of the mind that the presentation of plant forms instigates, it is particularly apparent how language is not secondary to morphology but instrumental in bringing it about. This is especially true of literary form and language as opposed to the essay, since literature can facilitate a double focus on thinking and seeing and thereby insinuates the engagement of the observer with the ideas presented. In this way, it also stages the metamorphosis of the observer in becoming receptive to what she sees, in allowing her observation of plants to make her perception "so beweglich und bildsam [...], nach dem Beispiele mit dem [die Natur] uns vorgeht" (24:392). The poem emphasizes this subject-object identity by continually inserting the act of looking and the involvement of the observer into the sequences of plant development: "Zwar nicht immer das gleiche; denn mannigfaltig erzeugt sich, / Ausgebildet, du siehst, immer das folgende Blatt"; "Und ein Wundergebild zieht den Betrachtenden an"; "Immer staunst du aufs neue, sobald sich am Stengel die Blume / Über dem schlanken Gerüst wechselnder Blätter bewegt" (24:421-22). The ambiguous formulation "Werdend betrachte" that begins the account of plant development underscores the development of the observer that happens in the act of observing plants: "Werdend betrachte sie nun, wie nach und nach sich die Pflanze, / Stufenweise geführt, bildet zu Blüten und Frucht" (24:421) She undergoes the same stages in her engaged observation and the staged process of becoming, a form of vicarious experience of plant life from which she emerges changed. When her gaze returns to the actual garden, the observer is in a position to listen to the plants "speak" to her, presumably in a language of their own:

Wende nun, o Geliebte, den Blick zum bunten Gewimmel,
Das verwirrend nicht mehr sich vor dem Geiste bewegt.
Jede Pflanze verkündet dir nun die ewigen Gesetze,
Jede Blume, sie spricht lauter und lauter mit dir. (24:422)

In the face of the dynamic image of plant growth, the observer also undergoes a metamorphosis in becoming receptive to what she sees and recognizing the possible manifestations of plant growth along with her own potential growth and development. The line "Bildsam ändre der Mensch selbst die bestimmte Gestalt!" can be understood

both as her ability to identify morphological changes in all living beings, according to the principle she has come to understand, and also a reflection on how this recognition changes her in the process (24:422). The poem maintains the double focus on observer and observed in order to underscore Goethe's morphology as a way of thinking about plants that allows them to shape our own thinking.

Literature affords a guided experience akin to the elusive intellectual intuition, appearing in the gap between idea and experience so difficult yet important to bridge in Goethe's natural science. Thus when he "flees to poetry" in *Bedenken und Ergebung*, literature is not an escape from the problem, but rather a possible solution. Part of why Goethe was so disappointed that his theory was not met with much enthusiasm within the scientific community is that, in his view, morphology addresses the central dilemma of natural scientific practice in modernity by presenting a way of reuniting the burgeoning masses of data and partialized views that modern science produces. Of course, his theory itself struggled with the splintering tendency of language and representation, especially given the increasing distance of words to things and the many words necessary to express phenomena justly. If according to Goethe, scientific knowledge cannot be communicated in finished form, representation must facilitate modes of experience from which ideas can emerge or continue to develop. Narrating his own efforts toward honing his perception and understanding of plants, as an open-ended process that involves others, can be read as an invitation to continue this work. As I have examined here, the elegy in particular brings together otherwise disparate views of part and whole, idea and experience. It does this through the rhythm of the text as well as the way it is able to expand and compress temporal sequences and how it makes symbolic ideas appear in sensuous manifestation. It insinuates a form of time-bound participation and processual thinking upon which morphology hinges, staging a form of "folgerechtes Bemühen," a study of plant forms not as complete and closed-off idea but as continual process.

