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Serialization in Goethe's Morphology

I

Pursuit of 'comparative epistemologies' presupposes an epistemology of comparisons or, at minimum, a relatively elaborate technique of comparing. Such a technique is available under the generic name of morphology. Since Cuvier professionalized comparative anatomy in the late 18th century, morphology has spread across a variety of disciplines and fields including literary criticism, linguistics, and a host of different life sciences. While the relationship – if there is one – of morphology as ubiquitous ancillary discipline to what Goethe had once envisaged as a «new science»¹ in its own right is far from clear, one may reasonably expect the latter to have something to contribute to an epistemology of comparison. On that question, there are good news and bad news. The bad news first: While Goethe, in the wake of his discovery of the intermaxillary bone in 1784 and upon publication of the «Metamorphosis of Plants» in 1790, did indeed hope to found morphology as a «new science» (365), his plans did not come to fruition. What remains of the new science he had hoped to establish is the multifarious record of a future past which he archived in the disturbingly heterogeneous periodical entitled «Notebooks on Morphology» appearing at irregular intervals between 1817 and 1824. Since neither Goethe himself nor anybody else has been willing to grant those compilations the status of a work, be it scientific or poetic², the publication of those treatises,

¹ Johann Wolfgang GOETHE, «Betrachtung über Morphologie», in: Johann Wolfgang GOETHE, *Schriften zur Morphologie*, Dorothea Kuhn (ed.), Frankfurt a. M. 1987, 361-369, here: 365. (All subsequent quotations from Goethe's writings on morphology refer to this edition and will be noted in round brackets in the text. All translations are my own.) Goethe himself believed in the legitimacy of morphology as an autonomous discipline because it would treat as its main subject matter what was merely accidentally treated in the various disciplines (cf. 368). In this regard it has to be understood as a meta-discipline useful to all sciences involving comparisons.

² In the first pieces of the «Notebooks», Goethe writes that what follows ought to be regarded not as a «work» but rather as a «project» (*Entwurf*), a fragmentary collection (390). He reiterates this at the beginning of a later section entitled «interjection» (*Zwischenrede*) (cf. 441).

reviews, poems, letters, anecdotes, and schemata by Goethe as well as others, notably colleagues from the younger generation such as Schelver, Carus or van Esenbeck seems justifiable only on historical grounds, as a chronicle of the development of biology during Goethe's lifetime. On account of the largely implicit synchronization of the course of science and the course of Goethe's life, the «Notebooks» are generally considered part of Goethe's autobiographical writings, such as the «Italian Journey» or «Poetry and Truth». The somewhat awkward subtitle with its chain of nouns – «Experience, Contemplation, Conclusion, Connected by Life Events» (399) – suggests as much, even though the entries lack even the minimal organizational principle of chronology. Except for the opening three pieces – Jena 1807, when Goethe first attempted to launch the project – none is dated. The editors of the various editions struggle to impose some order or system lending provisional coherence to the formless whole and its voluminous adjacent materials. Dorothea Kuhn opted for chronology in the Frankfurt edition, the Leopoldina proceeds thematically. The need to subject the loose collection of texts to such organizing principles underscores their absence in what appears to be a mere *Aneinanderreihung* (pieces strung together without any particular order). Compared to the «Notebooks on General Natural Science», which were co-published with those on morphology and in even sharper contrast to the compact and tightly organized «Doctrine of Colors», the «Notebooks on Morphology» are probably Goethe's most heterogeneous publication.

Yet, their «cobbled» (*zusammengestoppelten*) appearance³ notwithstanding, Goethe also believed the «Notebooks on Morphology» to be evidence of what he repeatedly calls «folgerechtes Bemühen» (752) or «folgerechte Tätigkeit» (405), continuous, consistent, coherent efforts or activity. In fact, he regarded such efforts just as much as alive as the living organisms that are morphology's main object: «Every pure effort is also something living, *purposeful in itself*, productive without goal, useful in ways one cannot anticipate» (485). And this is the good news: From the earliest comparative skull examinations to the *Urpflanze* as a model capable of generating entire series of not necessarily real but logically consistent plants, to the notion of an osteological type, Goethe prized *Folgerichtigkeit* enough to attempt to theorize it as a model for systematic comparisons. One could even say that *Folgerichtigkeit* is Goethe's only methodological maxim. Regarding all other questions of methodology he tends to be rather relaxed, not to say careless. Indeed, he once remarks that as a playwright, he has no difficulty entertaining conflicting viewpoints or suddenly switching positions (cf. 511). That skill is evident in his wavering in the debate on epigenesis as well as his equally ambivalent and hesitant reaction to Schelver's attempt to deny sexual reproduction

³ Johann Wolfgang Goethe in a letter to Langemann from October 16th, 1824, quoted in the commentary by Dorothea Kuhn, *op. cit.*, 1115.

of plants in favor of metamorphosis (cf. 509). Late in life, he mockingly named these rather unorthodox leaps between positions his «swing system» (*Schaukelsystem*) (708). But he was indeed insistent and persistent, *folgerecht* in all senses of the word, when it came to systematizing and organizing comparisons by fashioning sequences or series (*Reihen*). How to line up or bring in line Goethe's unorthodox leaps and wavering with his strong allegiance to seriality, is the question I am trying to address.

In contradistinction to the *Urpflanze*⁴ or the osteological type (*Typus*), both of which raise the specter of lingering Platonism, the motif of the series running as a thread through all of Goethe's varied morphological writings is too general, too vague and perhaps also too colloquial to have gained a prominent place in the Goethe universe. That universe is composed of the quasi-private terminology he developed in order to account for his interest in pursuing what Kant had theoretically allowed for but practically excluded as «intuitive understanding» (*intuitiver Verstand*) and the related idea of intellectual intuition.⁵ In addition to *Urpflanze*, and, of course *Steigerung* (elaboration, intensification, elevation but also comparison in the grammatical sense and hence clearly a noble cousin of the more pedestrian series or *Reihe*), there are other suggestive and enigmatic formulas such as «exact sensuous imagination» (615), the «eyes of the mind» (432, 461, 494), «objective intuition» (*gegenständliches Anschauen*) (595), «Ur-phenomenon» and many more. All of them are better understood as naming rather than solving the problem at the core of Goethe's morphological project: how to think together the lawful unity of nature as a whole and its infinitely varied appearance in time and space, diachronically as succession (as in the growth of a plant, for example), and synchronically as versatility of organisms to the point where their kinship is no longer detectable. At issue is, in other words, the contingency of forms which became ever more pressing as the number of known species of organisms grew exponentially at the end of the 18th century.⁶ With respect to our cognitive conditions, Kant invented the faculty of reflective judgment to address the problem. In a long awaited book, Eckart Förster has just made a convincing case that Goethe pursued an alternate route and succeeded in developing a method for what Spinoza had called *scientia intuitiva* but discussed in any detail only with reference to geometry.⁷ Among Förster's key pieces of evidence is Goethe's treatise on «The Experiment as Mediator between Subject and Object», written after he had

⁴ On the role of the *Urpflanze* in the Notebooks cf. Eva GEULEN: «Goethes Urpflanze», in: *Urworte*, Inka MÜLDER-BACH (ed.), Munich 2011, 155-171.

⁵ Cf. *Intellektuelle Anschauung. Bild, Rhetorik, Anschaulichkeit, Wissen, Evidenz*, Sybille PETERS and Martin SCHÄFER (ed.), Bielefeld 2006.

⁶ Cf. Wolf LEPENIES, *Das Ende der Naturgeschichte. Wandel kultureller Selbstverständlichkeiten*, Frankfurt a. M. 1976.

⁷ Eckart FÖRSTER, *Die 25 Jahre der Philosophie*, Frankfurt a. M. 2011.

studied Kant's Third Critique in 1792 but not published until 1817, when it appeared in the «Notebooks on General Natural Science», – notably *not* in those on Morphology.⁸ The text on the experiment is undoubtedly Goethe's most sustained reflection on serialization.⁹ In it, he objects to any use of experiments for the purposes of directly proving or disproving a thesis, claim or conjecture as intellectually dishonest and not *folgerecht*. Even two experiments can still deceptively give the impression of being related «whereas a long series of further experiments may be needed to bring them into a rather natural connection».¹⁰ In an effort to minimize the manipulative possibilities inherent in experiments, Goethe proposes «series of experiments» (*Reihe von Versuchen*). Ideally, any particular series is such that all the different experiments eventually amount to «one experience or one experiment represented under manifold viewpoints» (MA 691). For examples of this technique Goethe refers to his own experiments as described in the beginning of the «Doctrine of Colors.»

Before turning to the essay on the experiment from 1793, which is unavoidable when discussing series, but does not exhaust the varied functions of seriality in Goethe's morphology, a few words about the purpose of reconstructing Goethe's practice of seriality are necessary. I want to argue that Goethe's morphology is the site of a massive transformation of the notion of form¹¹, the scope and implications of which resurface after long latency at the beginning of the 20th century, for example, with Georg Simmel's sociologi-

⁸ However, Goethe does indeed point his readers to the essay on the experiment as useful preparatory reading (cf. 595) but he did not include it.

⁹ That can already be said of the subtitle of the «Notebooks on Morphology» or the sequence proposed in the essay on «Nachahmung, Manier und Stil». Moreover, serial patterns can even be discerned on the level of syntax as Uwe Pörksen and Gerhard Neumann, among others, have shown: Gerhard NEUMANN, *Ideenparadiese. Aphoristik bei Lichtenberg, Novalis, Friedrich Schlegel und Goethe*, München 1976, 623ff; Uwe PÖRKSEN, «'Alles ist Blatt'. Über Reichweite und Grenzen der naturwissenschaftlichen Sprache und Darstellungsmodelle Goethes», in: Uwe PÖRKSEN, *Wissenschaftssprache und Sprachkritik. Untersuchungen zu Geschichte und Gegenwart*, Tübingen 1994, 109-130; Robert STOCKHAMMER, «Darstellung als Metamorphose, wissenschaftlich und poetisch. Ansätze zu einer anderen Theorie des Symbols bei Goethe», in: *Aktualität des Symbols*, Frauke BERNDT, Christoph BRECHT (eds.), Freiburg 2005, 53-75.

¹⁰ Johann Wolfgang GOETHE, «Der Versuch als Vermittler von Subjekt und Objekt», in: Johann Wolfgang GOETHE, *Sämtliche Werke*, vol. 12, Hans J. Becker, Gerhard H. Müller, John Neubauer and Peter Schmidt (eds.), vol. 12, Munich 2006, 684-693, here: 688. All further quotations from this text refer to this edition and will be given in round brackets in the text as MA.

¹¹ In an unpublished paper, entitled «Form und Idee. Skizze eines Begriffsfeldes um 1800», David WELLBERY also identifies Goethe's writing on morphology as the site where the older eidetic form comes under scrutiny. For recent discussions of form cf.: *Form. Zwischen Ästhetik und künstlerischer Praxis*, Armen AVANESSIAN, Franck HOFFMANN, Susanne LEEB, Hans STAUFFACHER (eds.), Zurich/Berlin 2009; «Form and Formation of Life», Christoph Menke and Thomas Khurana (eds.), in: *Constellations* 18, 1 (2011).

cal notion of form-processes and the related idea of «reciprocity» (*Wechselwirkung*) (cf. 265). My interest lies in interpreting what looks like a theory of organisms and nature as a more general theory of formation and transformation. Since Aristotle and deep into idealist aesthetics and beyond, the philosophical notion of form (*morphe*) has been defined by its respective opposite terms such as matter, substance, material or content (*hyle*). This model loses its influence in Goethe's writings on morphology.¹² In them one can observe how certain aporias of the older (eidetic) concept of form give rise to a new formation of form, largely independent of matter, substance, content and their various permutations and also beyond the all-important distinction of visible vs. intelligible. This is so, because from the outset Goethe is less concerned with establishing a doctrine of forms than he is with accounting for the process of transformation of all living things. As he famously put it: «doctrine of form (*Gestaltenlehre*) is the doctrine of transformation (*Verwandlungslehre*)» (349).

The identification of consistent efforts as something living, purposeful in itself and infinitely productive, already indicates that life is not limited to organisms in the conventional sense. What qualifies as 'alive' or 'living' according to Goethe is minimally defined by two aspects. First, it is subject to transformation over time, which is why he preferred the terms «formation and transformation» (*Bildung und Umbildung*) (399) to the static implications of *Gestalt*. He was not interested in the accomplished shape of any given organism but in its becoming or emerging and, even more importantly – because questions of origin and descent did not interest him either, which is why the older scholarly tradition of searching for premonitions of Darwin in Goethe as inaugurated by Haeckel misses the point – Goethe was concerned with the transitions between forms. He was interested in forms on the move, as it were, because in nature «everything wavers (*schwanken*) in permanent movement» (392). Of course, the «delicate transitions» (504) at issue can neither be perceived nor discursively articulated. This impasse effects the notion of form and moves questions of representation into view.

The second criterion of life according to Goethe is the intrinsic multitude of all living things. Even what appears as an individual organism is intrinsically manifold: «Whatever is alive is not singular but a plurality. Even when it appears to us as an individual, it remains a conglomeration/collection (*Versammlung*) of independent living beings [...] these beings are in part already originally connected, in part they unite and

¹² Since aesthetics is usually credited with altering the idea of form, this raises the question whether Goethe's morphology ought to be considered 'science' or 'aesthetics' or even a combination of both. The question is decisive and has been much discussed. To be sure, Goethe himself has brought his morphology in close connection with his essay on «imitation, manner and style» and his treatise on the Roman Carnival. However, for the purposes of reconstructing the notion of form it seems advisable to preliminarily leave that issue an open question.

separate and thus effect an infinite production in all sorts of ways and in all directions» (392). The essential plurality of even simple organisms such as a plant needs to be emphasized because, coming from Kant's analysis of teleological and aesthetic judgments and remembering Goethe's excitement about the Third Critique¹³ one tends to focus on the special unity of organisms. However, when insisting on an essential plurality as the condition of life's productivity, Goethe refers to a multitude whose elements do not necessarily relate to each other as part and whole according to the idea of purposiveness (*Zweckmäßigkeit*) but are coordinated as parts of a collection (*Versammlung*) or accumulation in the sense of the Greek word *atroisimos* – which Goethe originally chose as the title of a poem first published in the «Notebooks» (472-474) and later known as «The Metamorphosis of Animals» in analogy to the elegy on the «Metamorphosis of Plants» from 1798 which was also re-printed in the «Notebooks» (420-423). Goethe's insistence on the multitude of every living organism suggests that the potential for serialization already resides as unspecified collection and collectivity in the object, a point to be returned to later. In any case, the plurality of even the most primitive life form on the one hand and Goethe's interest in the imperceptible phenomena of transition push the *morphe* of his morphology beyond its familiar scope. Henceforth form can no longer be exclusively conceived of as the unifying, closing, and enclosing shape of things. Such is my overall claim but it is not easily made.

Foremost among the obstacles is the form Goethe chose to give his theory of formation and transformation. By all accounts the «Notebooks» are lacking form altogether. This ostensible formlessness is especially irritating because from his earliest reflections in the 1780s onward, Goethe had demanded that morphology as a new science ought to be given «its own distinct form» (*eine eigene Gestalt*) (365). Even after he abandoned his plans for founding a new science, he continued to reflect on how to present his findings; he observes, for example, that the central idea of metamorphosis could never be presented «in an autonomous, closed work» (459). While Goethe was notoriously unimpressed by contradictions of the sort pointed out by Schiller¹⁴ and many philosophically astute critics after him, he was very concerned with the question of what form his ideas on formation and transformation should assume. Under these circumstances it is obligatory to at least consider the possibility that the «Notebooks on Morphology» are something other than autobiography, archive, or historical retrospective and that their apparent lack of form may be another form of form. This seems all the more likely since Goethe, fully aware that when compiling the Notebooks he

¹³ In the relevant entry, he writes of his encounter with Kant's text, «for the first time a theory seemed to smile at me» (443).

¹⁴ Cf. Goethe's famous anecdotal rendition of his encounter with Schiller as recorded in the «Notebooks» under the title «Fortunate Event» (434-438).

«lacked contemplation (*Sammlung*) which alone makes possible coherent thought» (*folgerechtes Denken*) (582), also expressed confidence that the maxims informing his approach would be discernable even in such a questionable environment.¹⁵

Moreover, if one tried to work out the notion of form in and of the «Notebooks» one would have to do so without recourse to the distinction between formlessness and form since that distinction belongs to the very discourse under transformation in Goethe.¹⁶ Under the circumstances, the persistent privilege Goethe ascribes to series is highly suggestive. Series provides a minimalist type of formation or formal arrangement, below the threshold where form can be distinguished from lack of form. As lowest common denominator, the idea of series could accommodate the loose string of entries filling the «Notebook» as well as the more elaborate idea of serialized experiments. The question is how!

II

For some time now, problems of seriality have enjoyed sustained attention as a genuinely modern phenomenon: serial art since Warhol and Stein¹⁷, serial industrial production, serial murder, set theory since Cantor and Gödel (reappearing in Badiou and Agamben). As Sabine Mainberger has shown in her study on the poetics of enumeration¹⁸, the possibilities of arranging sequences or series are virtually infinite, ranging from the strict mathematical series obeying a particular formula to identical repetition of the same elements. These very different types of serialization can in turn be organized in series. For example, in analogy to Jakobson's distinction between syntagmatic and paradigmatic series, one can imagine a typology of seriality according to varying degrees of difference and identity of its elements. For reasons worth paying some attention to, the currently dominant mode of ordering different types of seriality privileges the distinction between series composed of already given phenomena that are, as it were, inherently predisposed to being grouped together, vs. series as tool, technique, and a mode of construction – in short, the distinction between series conceived as grounded in substance or considered a method. This is the model proposed by Christine Blättler (with authoritative recourse to Ernst Cassirer's groundbreaking

¹⁵ In one of the opening pieces, Goethe writes: «Enough of this at this point, since given our whole mode presentation (*Darstellung*) our views cannot fail to surface again» (394).

¹⁶ On the changing role of monstra in 18th century and beyond cf. Georges CANGUILHEM, *Das Normale und das Pathologische*, Munich 1974. For an extended discussion cf. Maria MUHLE, *Eine Genealogie der Biopolitik. Zum Begriff des Lebens bei Foucault und Canguilhem*, Bielefeld 2008.

¹⁷ Cf. Klaus THEWELEIT, *Recording Angels' Mysteries*, Basel 1994.

¹⁸ Sabine MAINBERGER, *Die Kunst des Aufzählens. Elemente einer Poetik des Enumerativen*, Berlin 2003.

work from 1910 on the difference between substantive and functional concepts¹⁹) in her introduction to a recent volume on series in aesthetic theory and practice.²⁰ Obviously, a familiar historical narrative attends to this arrangement of serial types: pre-modern taxonomic series such as the tableaux Foucault described in «The Order of Things» are premised on the belief in inherent properties of the serially assembled objects. This increasingly gives way to the modern view that series are tools for creating an order rather than ways of representing a supposedly given order. There are many reasons to call this narrative and with it this organization of serial types into question, and many vantage points from which to do so. One good counter-example on the modern front is Paul Kammerer who wrote a rather successful book – incidentally mentioned by Freud in his essay on the Uncanny from 1919²¹ – by the paradoxical title «The Law of the Series», in which he argued that the series is not a methodological device construct but rather a generative principle operative in the world.²² According to Kammerer, seriality manifests itself in those patterns we are accustomed to write off as mere coincidences. The book, with its many examples, most of them taken from Kammerer's own experiences as a commuter on Vienna's public transport system, is undoubtedly bizarre. Readers such as Henning Ritter were quick to point out that Kammerer's «Law of Series» is an attempt to compensate for the critical threats arising from the contingencies of modern life.²³ Given that Kammerer, a biologist of Lamarckian convictions, later killed himself because his experiments designed to prove that acquired properties could be passed on to the next generation were questioned and his 'consistent efforts' declared a fraud, psychologizations are ready at hand.²⁴ However, the very fact that this book was written at the height of modernism and that throughout the 1920s there was indeed an obsession with the problem of seriality and contingency – the massive Dostojevski-reception testifies to this – Kammerer's book calls into question the familiar assertion, most strongly voiced by the neo-Kantian Cassirer, that serialization must ultimately be considered a method of the mind rather than a phenomenon in the world.

¹⁹ Ernst CASSIRER, *Substanzbegriff und Funktionsbegriff. Untersuchungen über die Grundfragen der Erkenntniskritik*, Berlin 1910.

²⁰ Christine BLÄTTLER (ed.), *Kunst der Serie. Die Serie in den Künsten*, Bielefeld 2010, 7-14.

²¹ Sigmund FREUD, «Das Unheimliche», in: *Studienausgabe*, ed. Thure von Uexküll, Ilse Gubrich-Simitis, vol. IV, Frankfurt a. M. 1982, 261.

²² The book has recently been re-edited by Esther VON KROSIGK, Verlag Dr. Müller 2008.

²³ Cf. Henning RITTER, «Der Zufallsjäger. Paul Kammerer und das Gesetz der Serie», in: BLÄTTLER, *op. cit.*, 43-56.

²⁴ For an account of Kammerer's life and death cf. Arthur KOESTLER, *The Case of the Midwife-toad*, London 1971.

With respect to Goethe the issue whether series is method or phenomenon begs the very question at the center of his enterprise²⁵ that scholarship has tried to answer ever since. In fact, Goethe's place within or vis-à-vis the modern age hinges on how one positions him on this issue. As long as the question is framed in terms of the alternative substance or method only two answers are conceivable. On the one side there are those who claim that all of Goethe's scientific efforts ultimately rest on his (pre-modern) belief in a pre-established harmony and essential affinity between perceiving subjects and perceived objects, presumably residing in a metaphysical substrate Goethe sometimes called *All-Natur*. Among the most sophisticated representatives of that view is Hans Blumenberg, who concluded his discussion of Goethe's understanding of the famous dictum *nemo contra deum nisi deus ipse* at the end of his book on myth with the suggestion «that Goethe's never quite articulated and perhaps ultimately unthinkable epistemology would only have been the particular case of the general principle of equivalence according to which only what is the same can enter into relations of any sort, including those of confrontation and enmity.»²⁶ For Blumenberg, therein consists «compared to Spinoza, the mythical feature of Goethe's transformation, his pre-Christian, fascinating but historically unavailable anachronism.»²⁷ On the opposite side are those claiming that Goethe superseded the alternatives of subject and object – hence of method and substance – and should be considered a forerunner of the modern idea of matter's spontaneous self-organization without a substrate. (Albert Liu's remarkable dissertation from 1996, for example, moves in a relatively straight line from Goethe via Spengler to Turing.)²⁸ Most recently, Eckart Förster has intervened in this debate with yet another position, directly opposed to Blumenberg but also distinguished from perhaps overly hasty claims for Goethe's proper place in late modernity. According to Förster, Goethe's modification of Spinoza lies in conceiving of serialization as an independent method devised by and for intuitive understanding. This is what he lucidly argues in his reading of the «Experiment as Mediator».

Rather than engaging this debate directly, I want to isolate and emphasize a few features of Goethe's essay on the experiment that might allow for postponing the apparently inevitable decision for one viewpoint or the other, thereby shifting the ter-

²⁵ This did not keep the exceptional Goethe scholar Ernst Cassirer from asserting as a matter of course that the serial principle was for Goethe «still a phenomenon of life» rather than a method. Ernst CASSIRER, «Goethe und die mathematische Physik. Eine erkenntnistheoretische Betrachtung», in: Ernst CASSIRER, *Idee und Gestalt. Goethe, Schiller, Hölderlin, Kleist*, Berlin 1921, 45.

²⁶ Hans BLUMENBERG, *Arbeit am Mythos*, Frankfurt a. M. 1979, 591.

²⁷ BLUMENBERG, *op. cit.*, 591.

²⁸ Albert LIU, *The Question Concerning Morphology: Language, Vision, History, 1918-1939* (Dissertation submitted to the Johns Hopkins University), Baltimore 1996.

rain a little so that other issues may enter the picture so dominated by the question of whether series in Goethe is grounded in a metaphysics of equivalence or in the sobriety of method.

III

I begin by noting several stylistic idiosyncrasies. From a certain point in his essay onwards, Goethe repeatedly uses two of its decisive terms – «experience» («*Erfahrung*») and «experiment» («*Versuch*») – together, in a series, syntactically on par and as a pair, whereas a conventional understanding would want to distinguish, perhaps even subordinate them to each other. Early on a sentence begins with such a parallel construction «Each experience we make, each experiment (*Versuch*) by which we repeat it [...]» (MA 688); Two paragraphs later the verb in the plural explicitly renders experience and experiment as two discrete subjects: «While from one side each experience, each experiment are by their very nature to be considered in isolation [...]» (MA 689); yet again a bit further: «Once we have grasped such an experiment, made such an experience [...]» (MA 691). Usually, one would be inclined to interpret such constructions as indicative of an underlying identity of experience and experiment. However, viewed as a mini-series, the elements are not synonymous but contiguous. And contiguity is in fact the only criterion Goethe provides for serially organized experiments. Their elements or components must «border directly on each other (*zunächst an einander grenzen*) and touch immediately» (MA 691). According to this definition, experience and experiment are neither identical nor subordinated but co-ordinated – without, however, entering into any recognizable, determined, or definable relation beyond their contiguity within the series.

A possible reason for Goethe's tendency to serialize 'experience' and 'experiment' in the described fashion is implicitly given by his definition of the experiment: «When we intentionally repeat those experiences we or others before us have made, or that others are making at the same time as us, and when we then represent (*wieder darstellen*) the phenomena, having resulted in part by chance, in part by design, then we call this an experiment» (MA 687). Just repeating contingent experiences intentionally and under controlled conditions does not yet amount to an experiment. In addition, *darstellen* or representing must intervene. And it is far from clear whether and where to draw the line between the practical experiment as the systematic representation of a contingent experience and representation as a discursive supplement to experimental practice. In either and even in both cases, *Darstellung* seems to provide the mediation Goethe demands when he objects to using experiments as a way to link experience

directly to an idea or a hypothesis. And serializing the key words is one way for this text to satisfy its demand for representation.

Representation, *Darstellung* also plays a role in the second observation. Experiment is not only serially linked to experience, but the very word «experiment» (*Versuch*) of course also means attempt or effort. At least on one occasion it occurs in a sentence that makes deliberate use of this equivocation.²⁹ It serves as a reminder that even serialized experiments are fated to be nothing but ‘consistent efforts’ in a potentially endless series. This follows from the disproportion between the infinite world of objects and finite human cognition «that no human possesses sufficient abilities to ever conclusively complete any matter» (MAG 691).

This leads to the third observation pertaining to a passage in the beginning of the text that, conversely, suggests the possibility of overcoming such constraints. As a prerequisite to any scientific cognition deserving that name, Goethe demands that scientists must learn to abandon their self-serving interests and select their criteria of judgment from the circle of objects: «As indifferent and quasi divine beings scientists should examine what is and not what pleases. Thus the true botanist shall not be moved by the beauty or the usefulness of plants but examine their formation, their relations to the rest of the plant world, and just as they are all called forth and shun upon by the sun, so he shall look upon them with the same quiet regard and take the measure of this cognition, the data of his judgment not from himself but select it from the circle of things he observes» (MA 684). The ideal of quasi-divine observers capable of ‘examining what is rather than what pleases’, clearly alludes to Kant’s argument for an *intellectus archetypus*. While we cannot conceive the world in such a divine manner, we can conceive of an observer capable of conceiving the world in this way.³⁰ Not satisfied with alluding to that argument, Goethe’s plant-simile puts analogy to work, as it were. The varied at-

²⁹ When Goethe emphasizes the role played by the imagination, he writes of the scientist: «and however much he might try to elevate his mode of imagining above the common one and seek to purify it, usually it still remains just an attempt/effort (*ein Versuch*) to bring many objects into a certain graspable relationship which, strictly speaking, they do not have on their own account; hence the tendency towards hypotheses, theories, terminologies and systems which we cannot object to because they result necessarily from the organization of our being» (689). If experiments are attempts to produce a relationship where there is none and both the efforts and their incompleteness are necessary features of our cognitive make-up, then the question of series as method or substance cannot even be posed.

³⁰ Immanuel KANT, «Kritik der Urteilskraft», in: Immanuel KANT, *Akademie-Textausgabe*, vol. V, Berlin 1968, 401-410. Eckart FÖRSTER has analyzed the pertinent § 76 and 77 in depth in an essay entitled «Die Bedeutung der Paragraphen 76 und 77 der “Kritik der Urteilskraft” für die Entwicklung der nachkantischen Philosophie», in: *Zeitschrift für philosophische Forschung* 65 (2002), 169-190.

tractions holding sway over self-interested observers are transferred from those subjects onto the objects which in turn are said to be attracted by the sun. From such implicit reciprocity it is hardly a leap to Goethe's famous poem about the sun-like human eye and the machinery of the Goethe universe could get under way towards an interpretation claiming essential equality between subject and object. Such a reading, however, would not be *folgerecht*. Indeed, the text moves in exactly the opposite direction. That implicit analogies will not suffice in this realm is made clear when Goethe reiterates the very dilemma Kant had attempted to solve by conceding that an *intellectus archetypus* was at least conceivable via analogy: «Man is more pleased by the presentation/imagination («*Vorstellung*») of a matter than by the matter itself, or rather we ought to say: Man only takes pleasure in a matter insofar as he presents it to himself; it has to fit his mode of thinking (*Vorstellungsart*) and however much he elevates his mode of thinking over the common one, however much he might purify it, usually it remains an attempt [or: an experiment (*Versuch*), EG] to arrange diverse objects in an imagined relationship, which, strictly speaking, they do not have on their own account» (MA 689). With this Kant's argument for the theoretical possibility of an *intellectus archetypus* stands exposed as flawed because it remains subservient to the subject's self-interested investments and pleasures. Goethe's own view of the matter turns out to be ultra-Kantian.

Goethe's invocation of the pleasure involved in exercising the imagination – presumably including imagining a divine being that can intuit things we cannot – corresponds to Rodolphe Gasché's interpretation of aesthetic judgments in Kant. According to Gasché, when Kant suggests that the pleasure of the aesthetic judgment pertains to the 'mere form' of the perceived objects, the 'mere' is neither meant privatively nor does it refer to the shape of objects but only to their potential conformity with our cognitive powers: «A judgment of taste savors not the phenomenal nature of what is judged but its susceptibility to empirical concepts [...] What causes the pleasure of such a judgment is merely that the powers of cognition achieve a representation of a natural form, hence of something that has the qualification of cognizability».³¹ Whether one shares Gasché's views or not and even though his reading pertains to aesthetic rather than teleological judgments, this amounts to a helpful description of the passage from the essay on the experiment just quoted. Of course, from Goethe's point of view the inevitability of the pleasure taken in imagining things has no redeeming qualities because such pleasure will always get the better of our scientific selves.

With that passage the core problem that Goethe's idea of serialized experiments sets out to resolve has moved fully into view. As it stands, human beings are essentially incapable of ever deriving the criteria of judgment from the circle of things because

³¹ Rodolphe GASCHÉ, *The Idea of Form. Rethinking Kant's Aesthetics*, Stanford 2003, 80.

their capacity for judgment and cognition is subject to limitations made palpable by the pleasures of imagining which, however, keep the subject from seeing things as they are. The only way out is the serialization of experiments, even if it is, at best, a partial and temporary solution, that is to say 'consistent effort': «Once we have grasped such an experiment and made such an experience, we cannot examine carefully enough what immediately borders on it? What follows upon it? This is what we have to pay more attention to than what it relates to» (MA 691). What an experiment or an experience refers or relates to – an idea, a claim, a hypothesis, a whole – must be excluded or at least suspended in favor of what came before and what comes next, what is ready at hand in a spatial rather than a chronological or semantic sense and what lies before or beyond any type of relation. This can be interpreted as presupposing some form of seriality, inherent in the object that is then mimetically emulated in the form of serialized experiments. However, the implicit rejection of Kant's analogy had already disqualified all mimetically induced strategies. Alternatively, the series is not given in objects but given to the imagination, which intuits the whole beforehand. But this would violate the essential criterion of sequentiality or *Folgerichtigkeit*.

At this point, the decision I wanted to delay regarding series as phenomenon in the world or method of the mind seems both inevitable and impossible. The reason why it is so difficult to get beyond this impasse is that Goethe's terminology of touch and immediate contact prevailing in the series of experiments carries suggestions of a link or a connection between them. This tends to eclipse the fact that Goethe proposes serialization not for the sake of connections but, on the contrary, to stave them off. The primary purpose of the series is not to link its components to each other but, conversely, to exacerbate, enforce, and radicalize the isolated nature of experiments by multiplying them and thus to reign in imagination's hasty leaps of faith.

That isolation and separation rather than linkage and connection are the purpose and structure of Goethe's series can also be inferred from the fact that no path and no series can ever lead from serialized experiments to the whole. Assuming that such a path or connection exists is to misunderstand the nature of experiments by relating them directly to a claim. There is no such relation or connection, and hence there are no mediating steps in between. The Fichtean reference to nature as permanent flux of effect and counter-effect preceding the passage on serialized experiments, leaves no doubt that the totality as totality remains forever removed from our cognitive grasp. The cosmos as a whole is said to be like a luminescent suspended globe emitting light in all directions, hence no isolated moments, no singular elements can ever be discerned by us (cf. 691). By contrast, isolation is the nature of experiences and serialized experiments articulate and formalize such isolation. If the elements of the series do not relate to each other

as parts making up a whole and the series itself does not relate as part to the whole of nature, then the series must be of an altogether other order than that of parts and whole.

Perhaps it is not a trifle to say that such an alternative understanding of series may help to explain why Goethe's 'consistent efforts' lead him to serialize his key concepts 'experience' (*Erfahrung*) and 'experiment' (*Versuch*) and also why he has no trouble demanding that we take the criteria from the circle of objects and then turning against that very possibility a couple of pages later. In other words: co-ordinated seriality could account for Goethe's willingness to let competing, conflicting positions stand next to each other, touching each other but not relating, neither as mutually exclusive nor as belonging together.

The only thread – though it is not a thread, strictly speaking – by which the series might be connected if not to the totality of nature then at least to some of its particular objects such as organisms is the *plurality* or pluralization it enacts: *Vermannigfaltigung* (MA 691) is what Goethe demands of experiments and it seems to resemble the collectivity residing in each organism.³² I had mentioned already that constitutive plurality is for Goethe an essential feature of all living things. Living things are legion and what is alive is legion. However, this is not the same as postulating or presupposing any essential equivalence or analogy between subjects and objects. Strictly speaking,

³² Admittedly, Goethe occasionally seems to ascribe the potential for seriality to the organisms themselves. Thus he writes that the scientist's highest duty is «to examine each condition under which a phenomenon occurs and to seek greatest possible completeness of the phenomena for in the end they are forced to appear in a series (*sich an einander reihen*) [...] and must form some kind of organization and manifest before the intuition (*Anschaung*) of the researcher their inner total life» (*ihr inneres Gesamtleben*) (442). Not surprisingly, this central idea of producing series of experiments is in turn linked to a series of related proposals aimed at pluralization or multiplication, in German, *Vermannigfaltigung*. Goethe insists on «the method of working with others». Scientists should not work alone but rather join forces and collaborate in groups. This entails an institutional praxis of publication very different from that of the artist; to ensure greatest possible control at every step of the way, «already a single experience, even only a conjecture» should be immediately submitted to the scientific community so that the materials and plans for the edifice are for all to see.» (687). (Incidentally, by 1831, when the scientific dispute between Geoffrey St. Hilaire and George Cuvier at the Paris Academy turned into a public scandal, Goethe substantially reviewed this earlier prescription from the essay on the Experiment and took the occasion to offer some remarkably insightful reflections on media politics and scientific institution (810-842)). In the essay on the experiment, however, multiplication of observing subjects is something of a prelude to the pluralization of experiments. On the role of collectives cf. Dorothea VON MÜCKE: «Changing Forms in Nature, the Life Sciences and Authorship» in: *Representations* 95 (2006), 27-53. Safia AZZOUNI has argued that scientific collaboration is also operative in Goethe's «Wanderjahre» in: *Kunst als praktische Wissenschaft. Goethes «Wilhelm Meisters Wanderjahre» und die Hefte «Zur Morphologie»*, Köln 2005.

plurality cannot be identified as property of an organism because what is proper to life is not to have any identifiable propria but rather be multiple and infinitely productive.

Even Eckart Förster, whose reading of the essay on the experiment beautifully lines up Goethe's allusions to Spinoza, Fichte, and Kant and spins them all into a coherent argument that supplies the links missing in the text's progression, concedes that Goethe's proposed serialization of experiments still lacks a crucial dimension, namely the aspect of transition from one experiment to the next which Goethe began to emphasize a little later. According to Förster, Goethe's essay on experiments qualifies as a fully fledged method for intuitive understanding only once one adds this notion of transition. In a footnote of the respective chapter, Förster explains that Goethe's central sentence on serialized experiments could then no longer read: «what comes next and borders immediately on the former», but: «how one experiment borders on the former and the next». ³³ Since my purpose is not as Förster's a «systematic reconstruction» (his book's subtitle) but rather an attempt to understand serializing practices in the «Notebooks», the fact that Goethe's sentence says what it says and that the element of transition is indeed missing in the essay, is worth holding on to. ³⁴ Perhaps this is not a shortcoming but, actually, the whole point of serialization as proposed in the essay on the experiment.

In support of that claim I want to turn to a last passage in the essay on «The Experiment as Mediator» involving the notion of series. As is well known, Goethe credits serialized experiments with being «experiences of a higher kind» (MA 691). As such they are nothing more and nothing less than «materials» (*Materialien*) (MA 693). What this means is made clear in the essay's final suggestion regarding further use of those materials yielded by serialized experiments: «But these materials (that is to say, those higher experiences, E.G.) must be organized and laid down in series; they must not be composed in hypothetical ways, not used for the purposes of a systematic form. Then everybody is free to connect them in their own fashion and to compose out of them a whole, more or less convenient and pleasurable to whatever the human mode of imagining» (MA 693). Serialized experiments amounting to higher experiences are only a first step; in turn they must be organized and represented as series, sufficiently

³³ FÖRSTER, *op. cit.*, 262, footnote 9.

³⁴ Förster's book is a scholarly achievement in all respects but its most significant contribution consists perhaps in having made the case for Goethe as a philosopher and even as the philosopher without whom German Idealism between Kant and Hegel would have been inconceivable. The philosophical argument is absolutely compelling, the philological evidence marshaled in its service equally so. What this elevation of Goethe to a philosopher means for Goethe the writer and his texts as literature is an open question. Förster's intervention will certainly affect it. For literary critics, his book poses a challenge whether and how the charted philosophical territory leaves room for other sites and venues.

loose and indeterminate for everybody to fashion something from them as suits their respective manner of imagination (*Vorstellungsart*). Like the first serialization, such second order series of previously serialized experiments are not governed by any internal or inherent law, in contrast to a mathematical series based on a formula. Moreover, even the location of the elements within the series must be flexible enough to allow for rearrangements by various modes of imagination. In other words, the second order series representing the materials of higher experiences must in some sense be random.³⁵

It will come as no surprise that, in my opinion, Goethe's «Doctrine of Colors» does not fit that description whereas the «Notebooks on Morphology» very much do. Their lack of an immediately recognizable order may stem from the desire to provide materials rather than doctrine. Hence my hopefully consistent efforts have led to the next step in the attempt to make sense of Goethe's *Notebooks on Morphology*: figuring out the serial logic in which these materials are presented. For simply noting a systematic concern behind the unsystematic series of entries will certainly not suffice. The task is to determine and identify the 'higher experiences' that the «Notebooks» contain 'in' or 'as' second order seriality in the form of mere *Aneinanderreihung*.

Identifying such structures must satisfy one criterion above all. They must conform with or respond to a double sense of form: as a form on the level of objects and as a form of presentation, because Goethe himself doubled the notion of series in the essay on the experiment, making it a fit technique for observing objects and introducing it as a principle of representation or presentation. The limits of the area of investigation thus disclosed can be marked by two misreadings that Goethe reports his essay on the «Metamorphosis of Plants» from 1790 to have been subjected to. In the «Notebooks», Goethe recalls that upon its first publication one reader mistook the treatise for a manual teaching painters how to produce flower arabesques in a coherent and consistent fashion (cf. 419). On occasion of the same text's last publication in a bi-lingual German-French edition in 1831, the typesetter mistakenly printed 'Les Metaphores' instead of 'Les Metamorphoses' (cf. 772). The leaves (*Blätter*) of the «Notebooks» – as Goethe frequently calls them – would have to be read between the

³⁵ An example for random seriality can be found in the schema Goethe developed and published in the «Notebooks» at the end of a brief discussion of Blumenbach (452). Located between the heading matter (*Stoff*) at the top and the word «form» on the bottom Goethe places a column-like series of other concepts: faculty (*Vermögen*), force (*Kraft*) violence / force (*Gewalt*), effort (*Streben*) and drive (*Trieb*). They are held together by a large bracket to the right besides which Goethe wrote «life» («*Leben*»). The sequence of concepts in the column certainly amounts to a series but whether and how it is organized conceptually – whether as synonyms or intensification – cannot be determined with any conclusiveness.

extremes of a misguided literalism of seriality on the one hand and an equally misguided reduction of seriality to metaphoricity on the other.

In closing, I would like to give one example of the intrinsically double formative principles I am looking for. Preliminarily, one may call it the paradigm of orality. As is well known, beginning with the studies on the intermaxillary bone, Goethe paid particular attention to jaw structure and teeth in a variety of species. He spent considerable time laying out bones in rows and producing series-like tables in the attempt to find an osteological type. This interest is not coincidental because with their mouth and teeth organisms come directly into contact with their environment. As a site of exchange the oral realm is also a privileged site of change. According to Goethe, within the constraints of nature's supposed budget – a dubious and certainly pre-modern conviction of his – the interaction of the organism with the conditions of its environment is the main reason for the disturbing versatility that constantly threatens his quest for lawful metamorphosis and led him to call metamorphosis «a gift from above which leads into the formless and destroys knowledge» (582). Not surprisingly, the oral sphere features prominently in the aforementioned poem on the «Metamorphosis of Animals» that Goethe originally published in the «Notebooks» under the name «Atroismos». In a series that a careful reading would have to trace, the poem moves from the mouths of animals fit for their food, via rows of teeth and jaw structure to the mouth of the Muse. Apart from this poem, perhaps the most significant text dealing with the particular status of jaw and teeth is a short piece on rodents published in the «Notebooks». Already deeply irritated by the rodents' «continuous, almost compulsively passionate, unintentionally destructive crunching (*Knuspern*) (633), Goethe is even more disturbed by the rampant versatility of that genus. He ascribes the «unstable oscillation/wavering» (*unstetes Schwanken*) of their appearance to their deficient tooth structure «because of which this genus is let loose to abandon itself to a certain arbitrariness of formation to the point of non-form» (ibid). Tempting as it may be to read this oscillation and crazy *Schwanken* as poetological metaphor mirroring the disturbing heterogeneity of the «Notebooks», my point is different. Goethe's systematic concern with the oral sphere has to be considered in line with a somewhat different but contiguous type of orality that is largely responsible for the prevailing impression of heterogeneity. Many voices join the conversation enacted by the «Notebooks». Moreover, the entries are frequently provided with titles suggesting oral conversation such as «interjection» (*Zwischenrede*) (441), «friendly call» (*freundlicher Zuruf*) (522) followed by «angry exclamation» (*unwilliger Ausruf*) (523) or «problem and reply» (*Problem und Erwiderung*) (582). Adding to the pervasive impression of oral conversation is Goethe's tendency to interrupt himself and gesture towards something not yet or never said, producing what rhetoricians call anaphosis, such as: «Several things ought to

be mentioned before we conclude» (542) or «Unwillingly we interrupt this» (631) and «considerations which I will communicate without any further preparation» (575). Adding to the sense of spontaneous orality are Goethe's frequent references to the current writing situation. At one point he even announces that he will add something in Latin just to fill the page for the printer (cf. 560). The orality at work in the «Notebooks» never congeals into narrative cohesion.³⁶ Rather than narrative, the peculiar mode of presentation might have to do with what Andrew Piper, in a recent reading of the «Wanderjahre», has called «paraphrastic writing», which he characterized as an attempt to leave the medial constraints of the closed book-form behind without taking the Romantic route of self-reflexivity.³⁷

Orality, understood as a motif-like substructure below the threshold of formal (for example narrative) organization, may be understood as one site where the form of objects, Goethe's theory of formation and their presentation in the «Notebooks» cohere in a precarious serial fashion without transitions between the different aspects and without forming a recognizable shape. The elements may be said to touch as teeth do in a jaw but they do not relate to or form a whole. In a sense, this type of seriality renders the question whether series are grounded in substantive equivalence of subject and object or ought to be considered as a method moot by making both contingent on modes of representation. Moreover, the initial tension between Goethe's tendency to leap from one position to the other, from idea to experience and vice versa on the one hand and his unwavering commitment to 'consistent efforts' also disappears in a type seriality that can accommodate both difference and contiguity. – Whether such a practice of serialization is helpful for the pursuit of comparative epistemologies is for others to decide. Regarding the project of articulating the transformation of form in Goethe's morphology it is a first step in what will have to be a series of steps.

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³⁶ The hasty identification of seriality with narration is the problem with Chad WELLMON's recent article on «Goethe's Morphology of Knowledge or the Overgrowth of Nomenclature», in: *Goethe Yearbook* 17 (2010), 153-177.

³⁷ Andrew PIPER, «Paraphrasis: Goethe, the Novella, and Forms of Translational Knowledge», in: *Goethe Yearbook* 17 (2010), 179-201.