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Ecocriticism, Goethe's Optics and *Unterhaltungen deutscher Ausgewanderten*: Emergent Forms versus Newtonian "Constructions"

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Goethe's Boccaccio-style collection *Unterhaltungen deutscher Ausgewanderten* has long been considered an anomaly, an assemblage of mostly borrowed tales barely worthy of inclusion in his oeuvre. There is little consensus about how to read the stories shared by a group of German aristocrats who are forced across the Rhine into another castle in the wake of the French Revolution. Early responses regarded the tales with disbelief (Wilhelm von Humboldt writes: "Die Unterhaltungen mißfallen durchaus und total"; Christian Gottfried Körner asks: "Aber was meint denn Goethe eigentlich mit seinen Unterhaltungen?";¹ and Charlotte von Stein comments in response to the "Klopfsgeist" tale: "Dem Goethe scheint's gar nicht mehr Ernst um's Schreiben zu sein").² Since the initial bafflement, most interpretations have articulated various forms of progression through the tales. The *Unterhaltungen* outline in such readings a development from social chaos to harmony,³ a counterpart to Schiller's aesthetic education,⁴ a literary experiment with the novella culminating in the enigmatic *Märchen*,⁵ or Goethe's struggle to write the violence of the French Revolution into coherence.⁶ That there is a development is apparent, yet the previous efforts to delineate it tend to overshadow the fact that once the revolutionary context for the framing narrative has been established, the central concern both there and in the tales—as in Goethe's optics—is the problem of perceiving and understanding various physical incidents.

Focusing on perception—a central theme throughout Goethe's literature and science—reveals a consistent development in the *sequence of perceptual categories* presented by the *Unterhaltungen's* tales.⁷ This sequence begins with sounds and hearing (the screaming, the shots, and clapping surrounding the Sängerin Antonelli, and the knocking in Friedrich's "Klopfsgeist"), moves through the embrace and renunciation of physical desires (the Bassompierre tales of passion followed by the emphasis on "Entsagung" in the two "Kaufmannsgeschichten"), and culminates in the *Märchen's* visual spectrum of colors,

light, and shadow. Furthermore, the framing narrative emphasizes this context with the figures' wildly diverging speculations about how to perceive and interpret the mysteriously cracking desk. The key to the *Unterhaltungen*, I contend, is to observe the tales' almost obsessive play with perception, interpretation, and the senses as part of our dynamic interactions with the world; in turn, the key to Goethe's ideas about perception is to be found in the work with which he was obsessed during the writing of this collection: his scientific pursuit of optics. When reading the *Unterhaltungen*'s development in light of Goethe's optics and study of perception, we discover an encoded "revolution" storming the "Bastille" of Newtonian theory and replacing it with a view "reconciling" our perception with nature.

Goethe described his optics, in fact, as a "revolution" of equal import to the political upheavals of the French Revolution. According to Eckermann's "Gespräche," Goethe claimed: "Um Epoche in der Welt zu machen [. . .], dazu gehören bekanntlich zwei Dinge; erstens, daß man ein guter Kopf sei, und zweitens, daß man eine große Erbschaft tue. *Napoloen* erbte die französische Revolution, *Friedrich der Große* den schlesischen Krieg, *Luther* die Finsternis der Pfaffen, und *mir* ist der Irrtum der Newtonischen Lehre zu Teil geworden."⁸ These two "revolutions" converge in Goethe's own experiences, as we see in his extensive writings on optics, colors, and Newton from the time he spent accompanying Herzog Carl August's army into battle against the French during 1792–1793. Goethe's response to the French Revolution is to turn away from violence and demand instead a fundamental alteration of our perception in both its physical and conceptual aspects. Rather than seeking either political utopia or a call to revolt, Goethe concentrates on a grounded interaction with our surroundings that might shift our understanding of *everything*. This is possible, he asserted, when avoiding all theories until one has carried out numerous experiments and gathered the work of multiple voices together (as in his optics and in the *Unterhaltungen*), thereby allowing a "natural sequence" to emerge. The answer lies in the sequence and the process, not in some final product. This emphasis on sequence and a concentrated engagement with perception suggests an explicit affiliation between Goethe's optics and his *Unterhaltungen deutscher Ausgewanderten*, as do also the multiple authors, and revolutionary themes found in both. Yet a survey of the critical scholarship reveals numerous readings of its final tale, the *Märchen*, in terms of various aspects of Goethe's science,⁹ but usually not the collection as a whole and rarely with a specific focus on the optics.¹⁰ Although H. Popper and Bernhard Gajek both describe an overall development in the collection using Goethe's science, they focus on the "morphological" aspects of its "polarity" or its structure unfolding like a plant.¹¹ There remains more to be done on the relationship of the *Unterhaltungen* to Goethe's optics, particularly regarding how Goethe—like ecocriticism—foregrounds the dynamic interface of our perception with nature.

As it is defined in the now standard *Ecocriticism Reader*, ecocriticism has the “fundamental premise that human culture is connected to the physical world, affecting it and affected by it. Ecocriticism takes as its subject the interconnections between nature and culture, specifically the cultural artifacts of language and literature.”¹² The initial focus of ecocriticism was on overtly “green” or nature-oriented works in the American and British tradition, though it has since expanded to more international queries as well as more broadly ranging studies of the urban, toxic discourse, environmental justice, the exchanges between science and literature, and other topics “beyond nature-writing.”¹³ Furthermore, ecocriticism’s interrogation of the environment-human interface as a dynamic site of interaction suggests that we still need extensive reconsideration of our day-to-day vision of “self-determining” human agency freely constructing our world.¹⁴ Despite postmodernism’s thorough debunking of our linguistic and cultural agency we still remain surprisingly hubristic when debating environmental alteration, devastation, or conservation.¹⁵ Ecocriticism tries to overcome such hubris by acknowledging the interrelated flows of power and resources in ecology, culture, language, and economics, even as it seeks to alter our perception and ultimately our social practices. Perhaps the greatest challenge for such environmental thinking remains the apparent chasm between perception and behavior. In this context, it is highly relevant that Goethe’s entire optical quest works towards the first task of changing perception; yet whether this could also produce a behavioral change remains to be seen. He rather optimistically asserts that one can at least give form and direction to our human perception: “Der Mensch kann und soll seine Eigenschaften weder ablegen noch verläugnen. Aber er kann sie bilden und ihnen eine Richtung geben.”¹⁶

The primary characteristic of Goethe’s science is its insistence on dynamic and fluidly reciprocal flows. This scientific view has provoked numerous ecological discussions, although there are still relatively few ecocritical readings of his literary works.¹⁷ He offers a promising paradigm for ecocritical study with his intense reconsideration of our perception together with the emergence of natural forms. “Ist das ganze Dasein ein ewiges Trennen und Verbinden, so folgt auch daß die Menschen im Betrachten des ungeheuren Zustandes auch bald trennen, bald verbinden werden.”¹⁸ Yet the greatest danger, he asserts, is always the imposition of our preconceptions onto this process. Studying nature for Goethe is thus not a process of corraling *it*, but rather *ourselves*.¹⁹ That is, we must undertake a process of double restraint: first, the restraint of the egocentric self-reflection coloring most of our perception, and second, the restraint of existing theories (like Newton’s) that “blind” entire generations. Michael Böhler states that Goethe’s reshaping of our perception is: “ein Prozeß, in dem der Mensch als kreatürliches Wesen wieder an die Natur zurückgebunden, und das heißt: *in seine Schranken wieder verwiesen wird*, und damit ein Prozeß, in dem die rationale Intelligenz wieder an die übrigen

Gemütskräfte gebunden wird.”²⁰ Such restraint is a form of Goethe’s famous “Entsagung,” an act that in this context strives to overcome our desires and assumptions in order to allow things to “emerge” on their own terms and to find thereby fitting formulations for them.²¹ He emphasizes the need first of all to examine ourselves in perception. “Bei Betrachtung der Natur im Großen wie im Kleinen hab’ ich unausgesetzt die Frage gestellt: Ist es der Gegenstand oder bist du es, der sich hier ausspricht?”²² In his presentation of the historical developments in optics, Goethe celebrates Francis Bacon of Verulam even as he notes how difficult it is to suppress our own “Geist” when pursuing knowledge. “Hier scheint eine neue Epoche anzugehen, eine neue Bahn sich zu öffnen. Jeder Beobachter scheint gezwungen, auf die Willkür seines eigenen Geistes Verzicht zu tun und sich den bestimmten Sachen zu unterwerfen. Aber leider, es scheint nur! Weniger Männer haben Gewalt genug über sich selbst [. . .].”²³ Having power over yourself and subduing your “Geist” is thus Goethe’s definition of “Entsagung” that I use to explicate the fifth and sixth tales of the *Unterhaltungen*. It shares with ecocriticism the goal of altering our perceptions that all too often remain entrenched within anthropocentric expectations.²⁴

Goethe repeats his goal of renouncing the assumptions coloring our perception throughout his scientific essays on optics with vociferous refusals to begin with a theory or explanation (much like the silence in his literary praxis). Instead, he insists on first laying out the “evidence” for the reader, claiming “daß eine Theorie nur erst alsdann schätzenswert sei, wenn sie alle Erfahrungen unter sich begreift und der praktischen Anwendung derselben zu Hilfe kommt.”²⁵ Goethe postpones formulating theories, because he claims that Newton and his followers negatively influence our ability to perceive and analyze data with their premature assertions. Furthermore, presenting the order of experiments (or tales) “naturally”—a loaded term, but one quintessential for Goethe’s scientific ideas—means that there should “emerge” a straight-forward explanation by itself. The first paragraph of the introduction to his *Farbenlehre* begins, in fact, with the need to order the many phenomena we perceive, as well as the problems that arise when beginning with a theory rather than the objects themselves.²⁶ He therefore refuses in his optics and, I suggest, in *Unterhaltungen deutscher Ausgewanderten*, to explain the path he is following. He allows the experiments (optical and literary) to unfold before our “unprejudiced” eyes, with ironic apologies.

Man wird mir verzeihen, wenn ich nicht gleich anzeige, woher ich sie [die vielen Versuche, die auf Entstehung der Farben . . . angestellt worden] nehme, wo und wie sie bisher vorgetragen worden; wie man sie zu erklären gesucht und ob sie dieser oder jener Theorie günstig scheinen [. . .]. Sind die Materialien einmal beisammen, so ergibt sich die Anwendung von selbst.²⁷

In Goethe’s scientific “Entsagung,” the “Anwendung” thus “ergibt sich von selbst,” or *emerges* out the order and sequence of materials on its own; one

should not prejudice the observers and readers with premature theories. Again, he claims that we must concentrate on the methodical ordering: "Kein Phänomen erklärt sich an und aus sich selbst; nur viele zusammen überschaut, methodisch geordnet, geben zuletzt etwas was für Theorie gelten könnte."²⁸ From the sequence comes the meaning; not vice versa.

Looking then at the methodical order and sequence of the seven tales shared in the framing narrative of *Unterhaltungen deutscher Ausgewanderten*, we find several significant factors that provide the structure for the rest of this essay. First, the sequence follows a specific pattern of sensory play and perception; second, the collection is a compilation from multiple authors; and, third, more than half of these authors are French. Let us begin with the three-step development in the tales that becomes clear when considering the issue of sensory perception. To repeat from above, this development is delineated in the *sequence* of tales beginning with hearing (the ghost stories' inexplicable sounds), moving through an exploration of sensual pleasure and a renouncement thereof (Bassompierre's tales and the two "Kaufmannsgeschichten" with their attempts at "Entsagung"), and concluding finally with the visual aspects of the colors and many lights permeating the *Märchen*.²⁹ Hence, the three steps in the *Unterhaltungen* progress from our weaker sense of hearing through sensualist excess/suppression to our most profound (or so Goethe believed) connection to the world through vision. He insists on the glory of the eye in contrast to the relative weakness of the ear. "Das Licht überliefert das Sichtbare dem Auge; das Auge überliefert's dem ganzen Menschen. Das Ohr ist stumm, der Mund ist taub; aber das Auge vernimmt und spricht."³⁰ Similarly, he notes in his "Tonlehre" that "Gegen das Auge betrachtet ist das Hören ein stummer Sinn, nur der Teil eines Sinnes."³¹ This idea that the eye simultaneously perceives and "speaks," or that vision is as much receptive as creative, is Goethe's modern and insightful contribution in his not always accurate critique of Newton.³² The harmony he seeks is the reciprocal resonance of perception and creation with natural forms, which occurs when we learn to "hone our senses" and create with the same patterns.

In this context, the sensual indulgences in the Bassompierre tales are best understood as part of a polarity with the "Entsagung" stories describing attempts to restrain desire. This polarity has, on the one side, the embrace of personal desire that ends badly in both tales, and, on the other, the individualized paths of renunciation experienced by the businessman's young wife and Ferdinand. The young wife was "lucky" enough to feel desire for a man who "guided" her rather than seducing her. Similarly, Ferdinand "lucked out" with his specific circumstances, as I note below. The turn to renunciation in the two tales pertains, in actuality, only to specific individuals in particular situations and thus does not accomplish the radical upheaval of our system of perception as was Goethe's goal. Neither side of the polarity thus represents a "universal" and communal shift in perception and behavior. Yet out of their polarized

play with desire emerges the final story in the collection, the fairy tale, with its focus on light, vision, and figures that enact, as Schiller notes, a communal effort, “das gegenseitige Hülfeleisten der Kräfte und das Zurückweisen aufeinander.”³³ If hearing leaves us confused in the *Unterhaltungen*, and if indulging and “taming” our self-centered desires remains randomly individual and situational, then directing our “strongest” sense—vision—towards resonance with nature provides the *communal* answer.

The question remains, though, why Goethe wrote this collection in a manner that so clearly misleads most readers rather than producing yet another scientific essay about perception and optics. There is a certain irony in presenting tales about misled perception and interpretation that, in fact, mislead the readers’ perception and interpretation.³⁴ As a number of recent studies by Ettore Ghibellino, Jürg Mathes, Dierdre Vincent, and Gero von Wilpert demonstrate, Goethe frequently encodes his texts, cloaks the references, and adamantly refuses to explain his literary works even as he fills them with subtle references to those issues occupying his thoughts at the time.³⁵ Goethe himself writes to Schiller that he is encoding his ideas in *Unterhaltungen deutscher Ausgewanderten*. “Für die ‘Hören’ habe fortgefahren zu denken und anfangen zu arbeiten, besonders sinne ich auf Vehikel und Masken, wodurch und unter welchen wir dem Publico manches zuschieben können.”³⁶

Despite the “masks” hiding that which Goethe wants to foist upon the public, there is nevertheless not only a specific sensory development in the seven tales, but also an explicit focus in the framing narrative on questions of perception once the revolutionary background has been established and the stories have begun. That is, the group attempts to explain the sudden cracking of a desk that occurs, as it turns out, simultaneously to the burning of its twin desk at their nearby aunt’s property.³⁷ Friedrich, Karl, Luise, and “Der Alte” are discussing the first two ghost stories when they suddenly hear a loud cracking noise. It turns out it is the desk in the corner. “Die gewölbte Decke desselben war quer völlig durchgerissen; man hatte also die Ursache des Klanges [. . .].”³⁸ Friedrich and Karl each react quite differently in their efforts to understand and explain this event, and their reactions represent opposing stances on the question of scientific perception. Karl immediately wishes for a hygrometer to measure the air’s moisture (“Schade, daß wir nicht einen Hygrometer bei der Hand haben, rief er aus: gerade das Instrument wäre das nötigste!”),³⁹ thus voicing the scientific emphasis on instruments and calculations. Friedrich, on the other hand, leaps into seeing mysterious connections and views the split desk in terms of the fire he spots just then at his aunt’s property where a similar desk exists.

Indessen, sagte Fritz, ist mir ein wunderlicher Gedanke eingekommen, der uns wenigstens über das sonderbare Anzeichen des Schreibtisches beruhigen kann. [. . .] Ihr wißt, daß unsre Mutter schon vor mehreren Jahren einen ähnlichen,

ja man möchte sagen einen gleichen Schreibtisch an unsre Tante geschenkt hat. Beide waren zu Einer Zeit aus Einem Holze mit der größten Sorgfalt von Einem Meister verfertigt, beide haben sich bisher trefflich gehalten und ich wollte wetten, daß in dem Augenblicke mit dem Lusthause unsrer Tante der zweite Schreibtisch verbrennt, und daß sein Zwillingbruder auch davon leidet.⁴⁰

Friedrich decides to ride over to his aunt's house the next day and determine whether or not this is true. He therefore thinks of events in terms of context and connections, however mysterious, whereas Karl seeks instrumental readings.

When Friedrich returns the next day from his foray into the fire-damaged area, he reports that the other desk had indeed burned at precisely the same moment in time that their desk split (a clock damaged in the evacuation from the fire indicated the exact time). Friedrich's method of finding connections is much like Goethe's statement in his 1793 essay "Der Versuch als Vermittler von Objekt und Subjekt":

In der lebendigen Natur geschieht nichts, was nicht in einer Verbindung mit dem Ganzen stehe, und wenn uns die Erfahrungen nur isoliert *erscheinen*, wenn wir die Versuche nur als isolierte Fakta anzusehen haben, so wird dadurch nicht gesagt, daß sie isoliert *seien*, es ist nur die Frage: wie finden wir die Verbindung dieser Phänomene, dieser Begebenheiten?⁴¹

If Friedrich wants to find the "Verbindung" at all costs, Karl, in contrast, wants to see things in isolation and in measurements—as an empiricist of sorts. "Überhaupt, sagte Karl: scheint mir: daß jedes Phänomen, so wie jedes Faktum an sich eigentlich das Interessante sei. Wer es erklärt oder mit andern Begebenheiten zusammenhängt, macht sich gewöhnlich eigentlich nur einen Spaß, und hat uns zum besten, wie z.B. der Naturforscher und Historienschreiber."⁴² In actuality, Goethe agrees partially with each of them. One must, he notes, see the individual events *first* like Karl in isolation in order to avoid imposing one's self or preconceptions onto the object; but one must *then* like Friedrich understand everything in nature in its context and connections. Goethean perception itself occurs—idealistically—as a *sequential* process.

This desk thematic in the framing narrative links it directly to the sixth tale in the *Unterhaltungen*, the only other one original to Goethe besides the *Märchen*. The connection is both in context (this tale is told right before Friedrich arrives with the news that there was a simultaneous breakage of the twin desk) and content (a desk also plays a central role there). It portrays the adventures of Ferdinand, who is unhappy to see the extravagant expenses of his father while he himself is on a tight budget. By chance, he knocks against his father's desk and the lid flies open, allowing him repeatedly to "borrow" some coins so that he might buy expensive presents for his beloved Ottilie. He has no difficulties for a while as his father, a wealthy businessman, is not at all careful with his "Kasse." Yet his borrowings are discovered just before Ferdinand prepares to redeem himself and pay it all back with the gains from

his first business venture. Returning from his successful trip, Ferdinand comes home to find his father enraged after realizing that some gold was missing from the desk. The father begins accusing everyone in the house of stealing them, and shortly thereafter, Ferdinand's mother fears the worst when she learns of all the extravagant gifts her son has made to Otilie. It turns out that the missing gold was not the coins taken by Ferdinand, but rather some funds that the father had lent to a friend and forgotten about. All ends well when it is returned and Ferdinand also uses his own earnings to repay all that he took, as well as some additional funds lost through his father's disorganization. "Er eilte sein Handelsgeschäft zu vollbringen, stellte bald der Mutter das Geld zu, ersetzte selbst das, was er nicht genommen hatte, was er wusste, daß es bloß durch die Unordnung des Vaters in seinen Ausgaben vermisst wurde."⁴³ The emphasis in the tale is on the confusion of a mismanaged system that leads the figures to misperceive ensuing events.

The tale's action results from the desk's popping open, but also from the fact that the father does not have an organized system and so fails to calculate carefully in the first place. Almost as if responding to such miscalculations, Goethe writes in his 1793 critique of Newton, "Über Newtons Hypothese der diversen Refrangibilität":

Der vortrefflichste Rechenmeister kann eine Rechnung fertigen, an deren Kalkul nichts auszusetzen ist, und doch kann sie falsch sein, doch mit der Kasse nicht übereintreffen. Es durften ihm nur einige Belege fehlen, deren Mangel er übersah oder nicht bemerken konnte; sobald sich diese finden, fällt das ganze Zahlengebäude zusammen, und die an sich lobenswerte, bis auf den kleinsten Bruch der Pfennige, richtige Arbeit ist verloren und muss von neuem unternommen werden. [. . .] Daß dieses Newtons Fall in seiner Optik sei, hoffe ich in meiner Schrift ausführlich zu zeigen.⁴⁴

Note the emphasis on the faulty construction of the "Zahlengebäude," which means that the "building" must be entirely redone because of a small error. For Goethe, this is a matter of (mis-)calculation, (mis-)interpretation, and scientific (mis-)perception, and he sees Newton as being like the "Rechenmeister" who makes a single mistake that leads him to build an entire system with a false foundation. Goethe's optical writings and his tale about Ferdinand explore how such mistakes can influence all the subsequent work or events as well as our inability to perceive what is right in front of us. One misstep in sequence leads us down the false path of perception.

Ferdinand's tale ends finally when he realizes that Otilie is not the girl for him. He moves out to the country and marries the nice, nameless girl there; they lead a happy life with children who regularly sacrifice small pleasures in a form of "Entsagung." Hence this story, with its miscalculations and provocative desk thematic linking it to the questions of perception and interpretation in the framing tale, ends with renunciation. Even this is not, however, the ideal-

ized social statement as most readers interpret it, because what results from Ferdinand's renunciation and that of his family remains a chaotic system based on individual whim. The father asks the children to give up various treats even as he otherwise allows them "alles, und es fehlte nicht an Arten und Unarten in seinem Hause. Er schien über alles gleichgültig zu sein und ließ ihnen eine fast unbändige Freiheit."⁴⁵ The tales progress through problems of calculation and perception towards a form of "Entsagung" without yet arriving at an orderly system; only in the fairy tale do we find the overt references to light, color, and vision in a systematic form that directly displays the prismatic appearance of colors described in Goethe's optics.

The *Unterhaltungen* are thus, I suggest, an encoded narrative of Goethe's "scientific revolution" that shifts the emphasis from national and political interests onto the issues of perception and the need to question our entire "Zahlengebäude," the logic of our sequences or lack thereof, as well as the "sources" of influence on us, whether desire, disorganization, or widespread theories.⁴⁶ Let us now examine more closely exactly what sources are used in the collection. Of the seven tales shared, five are not original to Goethe. The practice of incorporating the works of others directly into his writings is a typical strategy of Goethe, as he states often in his literary and scientific contributions. Regarding his study of perception, he notes: "Es gilt also auch hier was bei so vielen andern menschlichen Unternehmungen gilt, daß nur das Interesse Mehrerer auf Einen Punkt gerichtet etwas Vorzügliches hervor zu bringen im Stande sei. [. . .] Ich habe mich bisher bei der Methode mit Mehreren zu arbeiten zu wohl befunden, als daß ich nicht solche fortsetzen sollte."⁴⁷ In his *Beiträge zur Optik*, in fact, he describes such a combination as the essential feature of his scientific work and highlights how the goal is not to be original but rather to find a coherent *sequence* in the world of inevitably interconnected ideas. Goethe claims to produce something useful only "wenn ich die vielen Versuche, welche bezüglich auf Entstehung der Farben von so vielen Beobachtern angestellt worden und die überall zerstreut liegen, zusammenbringe, und sie nach ihrer natürlichen Verwandtschaft ohne weitere Rücksicht in Ordnung stelle."⁴⁸ The emphasis is on the need to combine efforts as well as on finding a coherent sequence of materials.

Additionally, it is a noteworthy yet somewhat neglected fact that the Germans displaced by the French in the *Unterhaltungen* narrate, with minimal alterations, four *French* tales in the seven total: the popular ghost tale about the French actress Claire Joséphine Clairon de la Tude (renamed in Goethe's version as the Italian "Sängerin Antonelli" who is beset with mysterious sounds of screaming, shots, and clapping after having rejected a lover), two tales taken almost verbatim from Bassompierre (the 16th-17th-century courtier), and the "Prokurator's" tale taken from the 1462 *Cent Nouvelles nouvelles*. The other tales include a popular story current in Germany at the time (the "Klopfegeist"), and Goethe's own two contributions: Ferdinand's tale and the *Märchen*. These

stories are told as a means of distracting the group after the heated political debates between Karl, the youthful enthusiast for revolutionary principles, and the family's older, patriotic friend, the "Geheimrat." Yet the German refugees nevertheless begin their "conversations" by exchanging *French* tales with nary a word about the implications of such sources despite the fact that it is the *French* forces driving them to flee. The irony of this fact seems to have been neglected not only by the figures telling the stories but also by much of the scholarship on the *Unterhaltungen*.

As a means of exploring this irony in terms of my focus here on perception and Goethe's optics, I draw a parallel between the figures' lack of attention to their (French) sources and the French scientists in Goethe's era who unquestioningly adhere to Newton's ideas. The scientists fail, according to Goethe, to probe the Newtonian foundation of their thought. Goethe writes in 1793 that the revolutionary Jean Paul Marat and others working in optics suffer from an "Anglomanie" in their "blind" dedication to Newton. "Alles das war für die Franzosen verloren, deren Blick durch die magische Gewalt des englischen Gestirns fasziniert worden."⁴⁹ Voltaire, too, he accuses of irrationally obeying "das Newtonische Evangelium."⁵⁰ He directly accuses the French, in fact, of having "die größte Schuld an der Verbreitung und Verknöcherung dieser [Newtonschen] Lehre."⁵¹ Whereas the aristocratic figures in the *Unterhaltungen* seem so immersed in French culture that they overlook the origin of their stories (coded as Italian in one case), Goethe sees the French scholars as so immersed in Newtonian culture that they cannot perceive any other options. The difference nevertheless serves only to highlight in both cases how powerful trends, theories, and narratives take hold and shape not only our conscious thinking but also our unconscious choices and basic perception of the world, scientific or otherwise. Fuming about how so many scholars have been "blinded" by Newton's "apparitions," Goethe writes that Newton's ideas continue to plague us and "so *spukt das Gespenst* der diversen Refrangibilität noch immer in den Schulen der Physik [. . .]."⁵² Regarding Newton's "empty words" about the "decomposition of light," he similarly laments how it is: "wahrscheinlich, daß diese Gespenster noch bis in die zweite Hälfte des Jahrhunderts hinüber spuken."⁵³ This "ghost" thematic may well speak to the choice of beginning the *Unterhaltungen* with "Spukgeschichten." Newton's power over the minds of scientists seems as oppressive to Goethe as the political circumstances, and he seeks a revolution of ideas at the level of perception rather than on the battlefield. He does so with a rather ironic series of tales.

Goethe's "revolutionary" critique of Marat and Newton is perhaps best described as a disagreement about the "emergent" forms Goethe prefers in contrast to the closed and artificial "buildings" or "constructions" of Newton. Goethe's science was a life-long quest—one with ecocritical relevance—to see nature as a dynamic system of metamorphosis and fluid polarities out of

which emerge the forms of our reality. Well known are Goethe's descriptions of how colors "emerge" from the interaction of light and darkness, and how plant growth spirals upwards as the leaves and flowers emerge. He describes the "Metamorphose der Pflanzen" as "[d]ie geheime Verwandtschaft der verschiedenen äußern Pflanzenteile, als der Blätter, des Kelchs, der Krone, der Staubfäden, welche sich nach einander und gleichsam aus einander entwickeln [. . .]."⁵⁴ His definition of morphology emphasizes the dynamics of these emergent and sequential processes. "Die Gestalt ist ein bewegliches, ein werdendes, ein vergehendes. Gestaltenlehre ist Verwandlungslehre. Die Lehre der Metamorphose ist der Schlüssel zu allen Zeichen der Natur."⁵⁵ In fact, the dynamic processes of "emergent forms" are at the core of recent studies by John McCarthy, Herbert Rowland, and James van der Laan on how Goethe's work shares much with contemporary ideas in chaos and complexity theory.⁵⁶

While Goethe highlights fluid developments in his own theories, he describes Newton's ideas, in contrast, as an immobile and hastily constructed "building," a closed "Bau," or a collapsing ruin. He writes: "daß selbst das große Genie Newtons sich bei Erfahrungen *übereilte* und mit Folgerungen *zu frühzeitig* vorschritt; [. . .] daß *sein durch diese Bemühungen errichtetes Gebäude* die Menschen dergestalt *verblendete*, daß sie nach dessen Grund zu forschen zum Teil versäumten [. . .]."⁵⁷ The power of this "Gebäude"—this construction—blinds us to the extent that we fail to ask about its sources and foundation, even as it collapses. In the foreword to his *Farbenlehre*, Goethe writes: "Wir vergleichen die Newtonische Farbentheorie mit einer alten Burg, welche von dem Erbauer anfangs mit jugendlicher Übereilung angelegt, nach dem Bedürfnis der Zeit und Umstände jedoch nach und nach von ihm erweitert und ausgestattet, nicht weniger bei Anlaß von Fehden und Feindseligkeiten immer mehr befestigt und gesichert worden."⁵⁸ Newtonian theory, writes Goethe, is a badly constructed ruin ultimately doomed to disintegrate, "ein verlassenes, Einsturz drohendes Altertum," one characterized by "[die] labyrinthisch unzusammenhängende Bauart, das enge Notdürftige, das zufällig Aufgedruckene, das absichtlich Gekünstelte, das kümmerlich Geflickte."⁵⁹ It is above all, "artificial": "[I]ch erkläre vielmehr die diverse Refrangibilität nur für eine *künstliche* Hypothese, die vor genauer Beobachtung und scharfer Beurteilung verschwinden muß."⁶⁰

Understanding Goethe's resistance to Newton's "artificial constructions" is essential in following his critique of Marat. In his optics, the French revolutionary agrees with Newton on most counts such as light being heterogeneous and composed of all the colors. Goethe condemns the idea that "Das Licht ist zusammengesetzt: heterogen"; and that "Das Licht ist aus farbigen Lichtern zusammengesetzt."⁶¹ Simply put, both Newton and Marat understand light as composite, whereas Goethe insists that white light is pure and homogenous: "Das Licht ist das einfachste, unzerlegteste, homogenste Wesen, das wir kennen. Es ist nicht zusammengesetzt. Am allerwenigsten aus *farbigen*

Lichtern.”⁶² For Goethe, colors emerge from *interactions* where light is altered or refracted. He asserts that color is “ein elementares Naturphänomen für den Sinn des Auges, das sich, wie die übrigen alle, durch Trennung und Gegensatz, durch Mischung und Vereinigung [. . .] und so weiter manifestiert und unter diesen allgemeinen Naturformeln am besten angeschaut und begriffen werden kann.”⁶³ The main differences between Goethe and Marat/Newton pertain especially to whether colors are a matter more of light itself (Marat/Newton) or our perception of it (Goethe); for Goethe, light, though pure, must be understood in terms of its context, “*Wechselwirkung*,” and our vision. Light cannot be thought of abstractly. “Das Licht hingegen [im Vergleich mit der Finsternis] können wir uns niemals in abstracto denken, sondern wir werden es gewahr als die Wirkung eines bestimmten Gegenstandes, der sich im Raume befindet und durch eben diese Wirkung andere Gegenstände sichtbar macht.”⁶⁴ Goethe’s version of light, vision, and color derives from our interaction with the world, whereas he saw Marat, Newton and his followers not only as isolating light and color but also themselves from the world with artificial constructions.

With a rather ecocritical tone, Goethe posits that an ideal perception of emergent forms is most likely when we learn “to see and hear nature’s language.” “So spricht die Natur hinabwärts zu anderen Sinnen, zu bekannten, verkannten, unbekannten Sinnen; so spricht sie mit sich selbst und zu uns durch tausend Erscheinungen. Dem Aufmerksamen ist sie nirgends tot noch stumm [. . .].”⁶⁵ The interaction with nature’s forms is dynamic, as are the forms themselves:

So mannigfaltig, so verwickelt und unverständlich uns oft diese [Natur-]Sprache scheinen mag, so bleiben doch ihre Elemente immer dieselbigen. Mit leisem Gewicht und Gegengewicht wägt sich die Natur hin und her, und so entsteht ein Hüben und Drüben, ein Oben und Unten, ein Zuvor und Hernach, wodurch alle die Erscheinungen bedingt werden, die uns im Raum und in der Zeit entgentreten.⁶⁶

Recognition of this emergence requires resisting the urge to theorize. One must, however, explain the *sequence* and system of the approach rather than the *meaning* of the observations. Dennis L. Sepper notes Goethe’s emphasis of the “approach” itself:

The problem is that Goethe had long since come to realize that truth resides less in propositions than in experience, less in statements about nature than in the *adequacy of one’s approach to it*. The truth of science is to be judged fundamentally not by checking a single experiment, nor by measurements and margins of error—these are derivative—but by adherence to a way (method) that corresponds to and amplifies the encounter of human beings with nature.⁶⁷

Hence Goethe’s study of nature is a multifaceted process involving the task of learning to see and hear the “universelle Natursprache,” an attention to sequence (as with the *Unterhaltungen*), and the “Entsagung” of our expectations.

Being in tune with nature's emergent forms occurs, Goethe declares, when we then align our perception with them. "Es ist ein angenehmes Geschäft die Natur zugleich und sich selbst erforschen weder ihr noch seinem Geiste Gewalt anzuthun sondern beyde durch gelinden Wechseleinfluß mit einander ins Gleichgewicht zu setzen."⁶⁸ He seeks to subdue self-centered impulses not so much as a curtailment of pleasure but rather as a "pleasant" balancing with nature that enhances our perception and creative abilities.

The "Entsagungen" described in the *Unterhaltungen* also relate to Goethe's optical discussions of perception. Indeed, "der Alte" concludes Ferdinand's tale with the comment that one must find the "right time" to abstain or renounce. He notes that Ferdinand "scherzte mit mir als einem katholischen Geistlichen über meine Gelübde und behauptete, daß eigentlich jeder Mensch sowohl sich selbst Enthaltbarkeit als anderen Gehorsam geloben sollte; nicht um sie immer, sondern um sie zur rechten Zeit auszuüben."⁶⁹ The "right time" according to Goethe is when engaging with nature, and the best results are possible with the visual spectrum. This we find in the lights and colors of the fairy tale, the harmonious conclusion to the *Unterhaltungen*, in which all the figures come together "an der Zeit" and find a communal response. The *Märchen* outlines a development beginning in the darkness of night with strange limitations on crossing the turbulent river (and much of the action is driven by the back and forth crossings of the figures) and ending in the bright morning with a bridge and so a new system of visibly free-flowing movement.

I read the initial prohibitive circumstances as being like "Newton's system," at least according to Goethe, who notes in the *Farbenlehre*: "[M]an halte unsere Erklärung, unsere Ableitung gegen die Newtonische: die unsrige wird überall und vollkommen passen, jene nur unter kümmerlich erzwungenen Bedingungen."⁷⁰ At the close of the *Märchen*, Goethe's contrasting system prevails by incorporating harmoniously and without violence all the figures, as well as the giant's shadow (into a sundial), the old man's lamp, the wild antics of the "Irrlichter," and the snake's gleaming bridge. They act less as individual agents than as participants in an interconnected system. Because of the communal efforts, there emerges a bridge directly out of the great raging river that had previously divided the realm. In dawn's breaking daylight, the figures first see this long and opulent bridge, "die mit vielen Bogen über den Fluß hinüber reichte; sie war an beiden Seiten mit Säulengängen für die Wanderer bequem und prächtig eingerichtet, deren sich schon viele tausende eingefunden hatten, und emsig hin und her gingen."⁷¹ The bridge's free-flowing traffic stands in direct contrast to Newton's "artificial constructions" that, in Goethe's view, hinder the flow of new ideas in the same way that they "blind" our perception. To overcome such "constructions" via the "Entsagung" of our preexisting desires and theories, and to find resonance with nature's emerging forms is Goethe's battle, his "revolution" encoded in the *Unterhaltungen deutscher Ausgewanderten*.

Like ecocriticism, Goethe reconsiders our perception with an eye towards altering our contextualization of ourselves with the world. He was wrong about the nature of light but not about the interactivity of our perception. If the *Unterhaltungen deutscher Ausgewanderten* outline a development of perception critiquing Newtonian science, they nevertheless do so rather elliptically. Can we read this collection culminating with the fairy tale's light-filled performance as a call to action worthy of ecocritical ideals? A Goethean answer, despite its inevitable irony, may still be too optimistic considering the current environmental situation, yet it would posit a propitious emphasis on communal interaction and the *entanglement* of perceptual processes with emerging forms of nature. That is, our dynamic perception engages with the equally dynamic "hin und her" of nature at the environment-human interface. Concentrating on this permeable interface opens up, at the very least, a promising scenario for ecocriticism that reconfigures the dichotomy of perception versus action into a spectrum of interdependent engagement. Yet despite the *Unterhaltungen's* provocatively sequential progression of perceptual categories and the optical path of "natural" emergence, one is tempted to ask whether Goethe's collection of tales upholds the visionary hope that improved sight and perception will profoundly alter our situation—or whether it instead bitterly suggests that the real catalyst of cultural and perceptual change arrives in the rather mocking form of disruptive and unruly will-o'-the-wisps who spit out gold and so alter the economic flows. Goethe appears to advocate here that altered monetary practices (albeit not necessarily class structure) may much more radically and quickly—for better or worse—alter all forms of perception across the community than years of philosophical, political, and scientific labor. I close thus with an ecocritical tribute to the frivolous "Irrlichter" whose rather random acts of gold consumption and dispersal drive the action of the entire fairy tale. Their final gesture of tossing out more gold for the crowds gathered at the new bridge and temple provides the skeptical final scene for the *Unterhaltungen deutscher Ausgewanderten*: is it despair or hope to seek relief and new insights in brightly-lit tricksters?

¹ Cited in the commentary, "Wirkungsgeschichte, Dokumente," Johann Wolfgang Goethe, *Sämtliche Werke*, vol. 9. *Wilhelm Meisters Theatralische Sendungen. Wilhelm Meisters Lehrjahre. Unterhaltungen deutscher Ausgewanderten* (Frankfurt am Main: Deutscher Klassiker Verlag, 1992) 1524–1525.

² Cited in the commentary on the "Quellen" for the *Unterhaltungen* 1515.

³ Jane Brown sees the development in the *Unterhaltungen* as the path towards "social harmony through self-control and renunciation," and considers the various figures a "microcosm of German society." *Goethe's Cyclical Narratives: Die Unterhaltungen deutscher Ausgewanderten and Wilhelm Meisters Wanderjahre* (Chapel Hill: The U of North Carolina P, 1975) 20.

⁴ Those reading the collection as an engagement with Schiller include: Bernd Bräutigam, "Die Ästhetische Erziehung der deutschen Ausgewanderten," *Zeitschrift für deutsche Philologie* 96 (1977) 508–539; Katharina Mommsen, who focuses on the *Märchen*, "Bilde, Künstler! Rede nicht!: Goethes Botschaft an Schiller im Märchen," *Theatrum Euopaeum*. Eds.

Richard Brinkmann, et al. (Munich: Fink, 1982); Peter Pfaff, "Das Horen-Märchen: Eine Replik Goethes auf Schillers *Briefe über die ästhetische Erziehung*," *Geist und Zeichen*. Eds. Herbert Anton, Bernhard Gajek, and Peter Pfaff (Heidelberg: Winter, 1977) 320–332; and Bernd Witte, "Das Opfer der Schlange: Zur Auseinandersetzung Goethes mit Schiller in den 'Unterhaltungen deutscher Ausgewanderten' und im 'Märchen,'" *Unser commercium: Goethes und Schillers Literaturpolitik*. Eds. Wilfried Barner, Eberhard Lämmert, and Norbert Oellers (Stuttgart: Cotta, 1984) 461–485.

⁵ Discussions of the collection in terms of (modern) genre and form include: Günter Dammann, "Goethes 'Unterhaltungen deutscher Ausgewanderten' als Essay über die Gattung der Prosaerzählung im 18. Jahrhundert," *Der deutsche Roman der Spätaufklärung: Fiktion und Wirklichkeit*. Ed. Harro Zimmermann (Heidelberg: Winter, 1990) 1–24; Gerhard Fricke, "Zu Sinn und Form von Goethes 'Unterhaltungen deutscher Ausgewanderten,'" *Formenwandel*. Eds. Walter Müller-Seidel and Wolfgang Preisendanz (Hamburg: Hoffmann and Campe, 1964) 273–293; Joachim Müller, "Zur Entstehung der deutschen Novelle: Die Rahmenhandlung in Goethes 'Unterhaltungen deutscher Ausgewanderten' und die Thematik der Französischen Revolution," *Gestaltungsgeschichte und Gesellschaftsgeschichte: Literatur- Kunst- und Musikwissenschaftliche Studien*. Ed. Helmut Kreuzer (Stuttgart: Metzler, 1969) 152–175; Gerhard Neumann, "Die Anfänge deutscher Novellistik," *Unser commercium: Goethes und Schillers Literaturpolitik*. Eds. Wilfried Barner, Eberhard Lämmert, and Norbert Oellers (Stuttgart: Cotta, 1984) 433–460; Hans J. Rindisbacher, "Procurator or Procreator: Goethe's *Unterhaltungen* as Ironic Genre Praxis," *Goethe Yearbook* 7 (1994) 62–80; Christine Träger, "Goethes 'Unterhaltungen deutscher Ausgewanderten' als Ausdruck eines novellistischen Zeitbewußtseins," *Goethe-Jahrbuch* 107 (1990) 144–157; and Theodore Ziolkowski, "Goethe's 'Unterhaltungen deutscher Ausgewanderten': A Reappraisal," *Monatshefte* 50 (1958) 57–74.

⁶ Regarding Goethe's labor to "write" the French Revolution, see: Peter Morgan, "Critical Enlightenment and the Intelligentsia after 1792: *Die Horen, Unterhaltungen deutscher Ausgewanderten* and the 'Xenienstreit,'" *Antipodische Aufklärungen*. Ed. Walter Veit (Frankfurt am Main: Lang, 1987) 299–307; Klaus-Detlef Müller, "Den Krieg wegschreiben: *Hermann und Dorothea* und die *Unterhaltungen deutscher Ausgewanderten*," *Ironische Propheten: Sprachbewußtsein und Humanität in der Literatur von Herder bis Heine*. Eds. Markus Heilmann and Birgit Wägenbaur (Tübingen: Narr, 2001) 85–100; and Jürgen Söring, "Die Verwirrung und das Wunderbare in Goethes *Unterhaltungen deutscher Ausgewanderten*," *Zeitschrift für deutsche Philologie* 100 (1981) 544–559. August Raabe sees the tales as Goethe's efforts to overcome "das Ungeheure" of war through fiction. "Der Begriff des Ungeheuren in den 'Unterhaltungen deutscher Ausgewanderten,'" *Vierteljahresschrift der Goethe Gesellschaft* 4 (1939) 23–39. On Goethe's more general troubles with writing the revolution, see: Thomas P. Saine, "Goethe's Novel, *Campagne in Frankreich*," *Goethe's Narrative Fiction*. Ed. William J. Lillyman (Berlin: de Gruyter, 1983) 193–223.

⁷ Many authors highlight Goethe's emphasis on perception. See, for example: Dennis Sepper, *Goethe Contra Newton: Polemics and the Project for a new Science of Color* (Cambridge: Cambridge UP, 1988); and R.H. Stephenson, who writes: "The marginalization of perception, he seeks to show, is a deplorable consequence of the undue reliance placed on analysis and rationalization that has increasingly characterized Western thought and culture in the modern, that is the post-Renaissance, era, of which Newton is the outstanding, Titanic representative." *Goethe's Conception of Knowledge and Science* (Edinburgh: Edinburgh UP, 1995) 44. See also Gunter Mann, Dieter Mollenhauer, and Stefan Peters, eds. *In der Mitte zwischen Natur und Subjekt: Johann Wolfgang von Goethes Versuch, die Metamorphose der Pflanze zu erklären. 1790–1990. Sachverhalte, Gedanken, Wirkungen* (Frankfurt am Main: Kramer, 1992); and Victor Lange, "Goethe's Journey in Italy: The School of Seeing," *Antipodische Aufklärungen*. Ed. Walter Veit (Frankfurt am Main: Lang, 1987) 229–240.

⁸ Johann Wolfgang Goethe, *Sämtliche Werke*, vol. 39. *Eckermann. Gespräche mit Goethe* (Frankfurt am Main: Deutscher Klassiker Verlag, 1999) 116.

⁹ Explorations of Goethe's science in the *Märchen* are many; see in particular the discussions of optics in: Waltraud Bartscht, *Goethe's 'Das Märchen': Translation and Analysis* (Lexington: UP of Kentucky, 1972); Ingrid Kreuzer, "Strukturprinzipien in Goethes Märchen," *Jahrbuch der Deutschen Schiller Gesellschaft* 21 (1977) 216–246; Camilla Lucerna's summary, "Das Märchen": *Goethes Naturphilosophie als Kunstwerk* (Leipzig: Eckardt, 1910); Ingeborg H.

Solbrig, "Symbolik und ambivalente Funktion des Goldes in Goethes 'Märchen,'" *Jahrbuch des Wiener Goethe-Vereins* 73 (1969) 40–59; and my essay, "Seeing the Light: Goethe's Märchen as Science—Newton's Science as 'Fairy Tale,'" *Goethe Yearbook* 14 (2006) 103–127.

¹⁰ A number of studies stress the need to read the *Märchen* within its context, albeit usually without looking at Goethe's science. See Brown, and Peter Morgan, "The Fairy-Tale as Radical Perspective: Enlightenment as Barrier and Bridge to Civic Values in Goethe's *Märchen*," *Orbis Litterarum* 40 (1985) 222–243.

¹¹ Looking at the morphological form of the *Unterhaltungen* are: Bernhard Gajek, "Sittlichkeit statt Revolution. Die Versöhnung von Pflicht und Neigung als *Unerhörte Begebenheit*. Zu Goethes 'Unterhaltungen deutscher Ausgewanderten' (1794/95)," *Vielfalt der Perspektiven: Wissenschaft und Kunst in der Auseinandersetzung mit Goethes Werk*. Eds. Hans-Werner Eroms and Hartmut Laufhütte (Passau: Passau UP, 1984) 149–163; and H. Popper, "Goethe's *Unterhaltungen deutscher Ausgewanderten*," *Affinities: Essays in German and English Literature*. Ed. R. W. Last (London: Wolff, 1971) 206–245.

¹² Cited in the "Introduction," Cheryll Glotfelty and Harold Fromm, eds., *Ecocriticism Reader: Landmarks in Literary Ecology* (Athens, GA: The U of Georgia P, 1996) xix.

¹³ The phrase is from Karla Armbruster and Kathleen R. Wallace, eds., *Beyond Nature Writing: Expanding the Boundaries of Ecocriticism* (Charlottesville: UP of Virginia, 2001). For a summative history of ecocriticism, its concepts, and its new directions, see Lawrence Buell, *Writing for an Endangered World: Literature, Culture, and Environment in the U.S. and Beyond* (Cambridge: Belknap P of Harvard UP, 2001). For works seeking to expand ecocriticism's scope, see Michael Bennett and David W. Teague, eds. *The Nature of Cities: Ecocriticism and Urban Environments* (Tucson: The U of Arizona P, 1999); Annie Merrill Ingram, Ian Marshall, Daniel J. Philoppon, and Adam W. Sweeting, eds. *Coming into Contact: Explorations in Ecocritical Theory and Practice* (Athens, GA: The U of Georgia P, 2007); and Patrick D. Murphy, *Farther Afield: In the Study of Nature-Oriented Literature* (Charlottesville: UP of Virginia, 2000).

¹⁴ The environmental philosopher, Val Plumwood, criticizes our delusions of autonomous agency and our "dominant forms of reason" that "misunderstand their own enabling conditions—the body, ecology and non-human nature for example, often because they have written these down as inferior or constructed them as background in arriving at an illusory and hyperbolised sense of human autonomy." *Environmental Culture: The ecological crisis of reason* (London: Routledge, 2002) 16, 17.

¹⁵ Promising connections between postmodernism and ecocriticism are described by Serpil Oppermann, "Theorizing Ecocriticism: Toward a Postmodern Ecocritical Practice," *Interdisciplinary Studies in Literature and the Environment* 13.2 (2006) 103–128; and Dana Phillips, *The Truth of Ecology: Nature, Culture, and Literature in America* (New York: Oxford, 2003).

¹⁶ Johann Wolfgang Goethe, *Sämtliche Werke*, v. 13. *Sprüche in Prosa* (Frankfurt am Main: Deutscher Klassiker Verlag, 1993) 189.

¹⁷ For ecological studies of Goethe's science, see especially the final section on "Aktualisierung" in Peter Matussek, ed., *Goethe und die Verzeitlichung der Natur* (Munich: Beck, 1998); David Seamon and Arthur Zajonc, eds., *Goethe's Way of Science: A Phenomenology of Nature* (New York: State U of New York P, 1998), and Astrida Orle Tantilto, *The Will to Create: Goethe's Philosophy of Nature* (Pittsburgh: U of Pittsburgh P, 2002). The existing ecocritical readings of Goethe include the groundbreaking work by Jost Hermand, *Im Wettlauf mit der Zeit: Anstöße zu einer ökologiebewußten Ästhetik* (Berlin: Sigma Bohn, 1991); and Kate Rigby, *Topographies of the Sacred: The Poetics of Place in European Romanticism* (Charlottesville: U of Virginia P, 2004). See also my reading of *Werther*, "The Dangerous Quest for Nature Narratives in Goethe's *Werther*: A Reading of the Ruptured Monologue and the Ruptured Body," *Interdisciplinary Studies in Literature and the Environment* 14.2 (2007) 1–23.

¹⁸ Johann Wolfgang Goethe, *Sämtliche Werke*, v. 25. *Schriften zur allgemeinen Naturlehre, Geologie und Mineralogie* (Frankfurt am Main: Deutscher Klassiker Verlag, 1989) 114, #117.

¹⁹ Peter D. Smith also considers Goethe's work a challenge to our agency, especially of scientific views perpetuating the belief in human autonomy from nature. *Metaphor and Materiality: German Literature and the World-View of Science 1780–1955* (Oxford: Legenda, 2000).

²⁰ Michael Böhler, "Naturwissenschaft und Dichtung bei Goethe," *Goethe im Kontext: Kunst und Humanität, Naturwissenschaft und Politik von der Aufklärung bis zur Restauration*. Ed. Wolfgang Wittkowski (Tübingen: Niemeyer, 1984), 313–339; 335 (emphasis mine).

²¹ While most analyses of Goethean "Entsagung" concentrate on the social and ethical reasons driving the figures' choices, William Meads sees it as a three-part process involving, "sich hingeben, betrachten, erkennen," a description which shares much with the thesis here based on a process of refining our perception. "Goethe's Concept of Entsagung," *Pacific Coast Philology* 8 (1973) 34–41. See in contrast, Brown's emphasis on "social virtue."

²² Goethe, *Sprüche in Prosa* 50.

²³ Johann Wolfgang Goethe, *Sämtliche Werke*, vol. 23.2. *Beiträge zur Optik. Schriften zur Farbenlehre 1790–1807* (Frankfurt am Main: Deutscher Klassiker Verlag, 1991) 129.

²⁴ Goethe's 1793 essay "Der Versuch als Vermittler von Objekt und Subjekt," describes the problem of anthropocentrism (although without the term itself). "Sobald der Mensch die Gegenstände um sich her gewahrt wird, betrachtet er sie in Bezug auf sich selbst, und mit Recht. Denn es hängt sein ganzes Schicksal davon ab, ob sie ihm gefallen oder missfallen, ob sie ihn anziehen oder abstoßen, ob sie ihm nutzen oder schaden. Diese ganz natürliche Art die Sachen anzusehen und zu beurteilen scheint so leicht zu sein als sie notwendig ist, und doch ist der Mensch dabei tausend Irrtümern ausgesetzt, die ihn oft beschämen und ihm das Leben verbittern." *Naturlehre* 26. Karl J. Fink similarly discusses Goethe's insistence in the "Versuch" on overcoming oneself: "In the introductory paragraph Goethe acknowledged the scientist's subjective relationship to the object. And in the thesis paragraph he stated his view that objectivity might be gained if the scientist were to use the sphere of nature, rather than the self, as the measure of experimental organization." *Goethe's History of Science* (Cambridge: Cambridge UP, 1991) 39.

²⁵ Goethe, *Beiträge zur Optik* 19.

²⁶ The "Einleitung" begins by commenting "Die Lust zum Wissen wird bei dem Menschen zuerst dadurch angeregt, dass er bedeutende Phänomene gewahrt wird, die seine Aufmerksamkeit an sich ziehen. [. . .] Als dann bemerken wir erst eine große Mannigfaltigkeit, die uns als Menge entgegen dringt. Wir sind genötigt, zu sondern, zu unterscheiden und wieder zusammenzustellen; wodurch zuletzt eine Ordnung entsteht, die sich mit mehr oder weniger Zufriedenheit übersehen lässt." Johann Wolfgang Goethe, *Sämtliche Werke*, vol. 23.1. *Zur Farbenlehre* (Frankfurt am Main: Deutscher Klassiker Verlag, 1991) 23.

²⁷ Goethe, *Beiträge zur Optik* 65.

²⁸ Goethe, *Naturlehre* 94, #14.

²⁹ I discuss the *Märchen* as an enactment of Goethe's optical ideas and critique of Newton in "Seeing the Light."

³⁰ Goethe, "Das Auge" in *Beiträge zur Optik* 269.

³¹ Goethe, "Tonlehre" in *Naturlehre* 181.

³² For discussions of Goethe's scientific insights and his mistakes, see Jeremy Adler, "Goethe and Newton: Ansätze zu einer Neuorientierung am Beispiel der chemischen Verwandtschaft," *Goethe im Kontext: Kunst und Humanität, Naturwissenschaft und Politik von der Aufklärung bis zur Restauration*. Ed. Wolfgang Wittkowski (Tübingen: Niemeyer, 1984) 300–312; Matussek, Seamon and Zajonc, and Sepper.

³³ Cited in the "Dokumente" to the *Unterhaltungen*, 1526.

³⁴ Fittingly, "der Alte" notes to Luise that "Verwirrungen und Mißverständnisse sind die Quellen des tätigen Lebens und der Unterhaltung." Goethe, *Unterhaltungen* 1058 (emphasis mine).

³⁵ Friedrich Gundolf famously wrote: "Es genügt uns zu wissen daß Goethe, wie viele tiefen [sic] Menschen, zuweilen in Rätseln und ihm eindeutigen, für die Andren hundertdeutigen Zeichen zu reden liebte, aus Freude am offenbaren Geheimnis." Cited in the *Unterhaltungen's*: "Wirkungsgeschichte, Dokumente" 1537. See also Ettore Ghibellino, *Goethe and Anna Amalia: A Forbidden Love?* Trans. Dan Farrelly (Dublin, Ireland: Carysfort, 2007); Jürg Mathes, "Die 'Disproportion der Kräfte': Zu einer Buchstabenkonfiguration in Goethes 'Unterhaltungen deutscher Ausgewanderten,'" *Jahrbuch des Freien Deutschen Hochstifts* (1981) 116–130; my essay "Seeing the Light"; Deirdre Vincent, *Werther's Goethe and the Game of Literary Creativity* (Toronto: U of Toronto P, 1992); and Gero von Wilpert, "Die politische Sängerin. Spuk und Aktualität in Goethes *Sängerin Antonelli*," *Seminar* 27.3 (1991) 189–202.

³⁶ Goethe, cited in the "Entstehungsgeschichte" to the *Unterhaltungen*, 1508.

³⁷ Liliane Weissberg looks at the repeated references to desks and boxes in Goethe's work as a kind of internal space enfolded into an enclosure or a puppet theater, both of which can open

out into a different sort of reality. "Kästchenwahl," *Goethe Yearbook* 16 (2007) 61–82. Gajek sees the cracking desks as "das Unerklärbare." Brown sees the responses to the cracking as representing the flawed aspects of the individual figures; and Wilpert speaks of the desks as metaphors for the political situation where one "desk" (France) breaks and can cause the same thing to happen to its related "desk" (Germany).

³⁸ Goethe, *Unterhaltungen* 1030.

³⁹ Goethe, *Unterhaltungen* 1030.

⁴⁰ Goethe, *Unterhaltungen* 1031.

⁴¹ Goethe, *Naturlehre* 33.

⁴² Goethe, *Unterhaltungen* 1032.

⁴³ Goethe, *Unterhaltungen* 1076.

⁴⁴ Goethe, *Beiträge zur Optik* 136–137.

⁴⁵ Goethe, *Unterhaltungen* 1080.

⁴⁶ In the framing narrative, "der Alte" and Luise debate the issue of sources. "Luise: Sie werden uns doch nicht verwehren unsre Freunde und Nachbarn wieder zu kennen und wenn es uns beliebt das Rätsel zu entziffern. Der Alte: Keineswegs. Sie werden mir aber auch dagegen erlauben in einem solchen Falle einen alten Folianten hervorzuziehen um zu beweisen, dass diese Geschichte schon vor einigen Jahrhunderten geschehen oder erfunden worden. Eben so werden Sie mir erlauben heimlich zu lächeln, wenn eine Geschichte für ein altes Märchen erklärt wird, die unmittelbar in unserer Nähe vorgegangen ist, ohne dass wir sie eben gerade in dieser Gestalt wieder erkennen." Goethe, *Unterhaltungen* 1016.

⁴⁷ Goethe, "Der Versuch als Vermittler," in *Naturlehre* 28.

⁴⁸ Goethe, *Beiträge zur Optik* 65.

⁴⁹ Goethe, *Zur Farbenlehre* 865.

⁵⁰ Goethe, *Zur Farbenlehre* 869.

⁵¹ Goethe, "Analyse und Synthese," in *Naturlehre* 84–85.

⁵² Goethe, *Beiträge zur Optik* 135.

⁵³ Goethe, *Naturlehre* 98, #36.

⁵⁴ Goethe, *Sämliche Werke* vol. 24. *Schriften zur Morphologie*. "Die Metamorphose der Pflanzen" (Frankfurt am Main: Deutscher Klassiker Verlag, 1987) 110.

⁵⁵ Goethe, *Schriften zur Morphologie*, 349.

⁵⁶ See especially John McCarthy on emergent forms: "The 'Pregnant Point': Goethe on Complexity, Interdisciplinarity, and Emergence," *Goethe, Chaos, and Complexity*. Ed. Herbert Rowland (Amsterdam: Rodopi, 2001) 17–31; and Fink. For discussions of how Goethe's ideas relate to chaos and complexity theory, see John McCarthy, *Remapping Reality: Chaos and Creativity in Science and Literature (Goethe-Nietzsche-Grass)* (Amsterdam: Rodopi, 2006); Herbert Rowland, ed., *Goethe, Chaos, and Complexity* (Amsterdam: Rodopi, 2001); James van der Laan, *Seeking Meaning for Goethe's Faust* (London: Continuum, 2007); and the essays on Goethe in *Disrupted Patterns: On Chaos and Order in the Enlightenment*, eds. Theodore E.D. Braun and John A. McCarthy (Amsterdam: Rodopi, 2000). See also Ira Livingston's use of "emergent" to describe self-organizing systems. He defines language as an "emergent and semiautonomous phenomenon, something more like galaxies, ecosystems, and bacteria." *Between Science and Literature: An Introduction to Autopoetics* (Urbana: U of Illinois P, 2006) 4.

⁵⁷ Goethe, "Newtons Hypothese," in *Beiträge zur Optik* 131 (emphasis mine).

⁵⁸ Goethe, *Zur Farbenlehre* 15.

⁵⁹ Goethe, *Zur Farbenlehre* 16. For further discussion of Goethe's critique of the Newtonian Burg, see my essay "Dynamics of Goethe's *Novelle*: The Never-Ending Journey to Newton's Burg," forthcoming in *1650–1850: Ideas, Aesthetics, and Inquiries in the Early Modern Era*.

⁶⁰ Goethe, *Beiträge zur Optik* 131 (emphasis mine).

⁶¹ Goethe, *Beiträge zur Optik* 106.

⁶² Goethe, "Resultate meiner Erfahrung" (of comparing Newton and Marat) in *Beiträge zur Optik* 107.

⁶³ Goethe, *Zur Farbenlehre* 25.

⁶⁴ Goethe, *Beiträge zur Optik* 23.

⁶⁵ Goethe, "Vorwort," *Zur Farbenlehre* 12–13.

⁶⁶ Goethe, "Vorwort," *Zur Farbenlehre* 13.

⁶⁷ Sepper, *Goethe contra Newton* 184 (emphasis mine).

⁶⁸ Goethe, *Sprüche in Prosa* 58.

⁶⁹ Goethe, *Unterhaltungen* 1080 (emphasis mine).

⁷⁰ Goethe, *Zur Farbenlehre* 475 (emphasis mine).

⁷¹ Goethe, *Unterhaltungen* 1111.