

Goethe, Husserl, and the Crisis of the European Sciences

Eva-Maria Simms
Duquesne University

Goethe belongs to the phenomenological tradition for a number of reasons: He shared Husserl's deep mistrust of the mathematization of the natural world and the ensuing loss of the qualitative dimension of human existence; he understood that the phenomenological observer must free himself from sedimented cultural prejudices, a process which Husserl called the epoche; he experienced and articulated the new and surprising fullness of the world as it reveals itself to the patient and participatory phenomenological observer. Goethe's phenomenological sensibilities and insights become more apparent when his work is brought into dialogue with Husserl's thinking. In turn Goethe challenges Husserlian phenomenology to a more careful investigation of the natural world and human participation within its order. Both Goethe and Husserl are searching for a science of the qualitative dimension of being.

I. The Crisis

“...and what are poets for in a destitute time?” asked Goethe’s contemporary, the poet Hölderlin. Hölderlin felt that the times destitution lies in the default of God and the extinguishing of the divine radiance in the world (Heidegger, 1971, p. 91). For Hölderlin, and other poets after him, the journey into the dark night of his age became a poetic calling to search for traces of the divine in modern existence. Goethe, too, experienced the destitution of his time, and his epic play *Faust* explores a modern individual’s yearning for the divine radiance and his quest to find his own spiritual path despite and against the conventions handed down by religious or philosophical traditions. Unlike Hölderlin (who spent decades in catatonic stupor in his tower in Tübingen), Goethe was made of sterner and more practical stuff and was not crushed by the darkness of his times. He not only searched for the trace of the fugitive gods through his poetry, but tried to take on the forces which occluded the divine radiance in nature: materialism and a mechanistic science. He struggled against the time’s destitution in his copious volumes of poetry, novels, and plays, but we find him also engaged with the spirit of his age in his volumes of scientific writings on botany, meteorology, geology, color theory, and anatomy. Here he encountered first-hand the narrowness and reductionism of the modern natural sciences, and he and his close friends fought a continuous battle to create an audience for Goethe’s unorthodox scientific thinking.

In general, however, we do not find in Goethe the despair and existential

angst which marks later poets, but an almost naïve and optimistic willingness to engage the scientists of his time in intellectual combat. Goethe's struggle, as Heller remarks tongue-in-cheek, centers around the key question: "But how is the poet to remain in the world if the world becomes more unpoetic every day? How is one to keep spiritual communion with the Earth Spirit, and at the same time outphysic Newton?" (Heller, 1959, p. 20). In Goethe's time (1749-1832) we find what Husserl's generation (1859-1938) a hundred years later calls "the crisis of the European sciences" only as a rumble on the horizon, a destitution intuited and sensed but only just coming into view.

Through far ranging readings, observation, experiments, correspondence, and visits with scientists, Goethe became a notable expert in the natural sciences. He spent much of his days with his scientific pursuits: he experimented with plant genetics in his gardens, conducted experiments on color phenomena, collected and compared anatomical specimen, and took up a study of weather phenomena. His work in botany and anatomy was taken seriously by a small group of eminent scholars like Blumenbach, Soemmering, Lavater, and Vicq d'Azyr, with whom he had an intense exchange of scientific ideas. He also profoundly influenced the German philosophers Herder, Schelling, Fichte, and the brothers Humboldt in their thinking about the natural world (Steiner, 2000). Goethe's own evaluation of his scientific work was that his scientific insights might be more important than his poetic productions, but the generations after him – with a few exceptions – mainly dismissed him as a dilettante. Today the general audience is surprised to hear that Goethe was a scientist. In the predominant discourse of our culture Goethean science has been repressed because it does not participate in the mechanistic and materialistic metaphysics which characterizes the sciences of our time.

Goethe's scientific writings are a faithful struggle against the attempt of scientists and philosophers since Galileo, Newton, and Descartes to denude nature of its living forms and to seclude human consciousness in its own subjective bubble. The infinite variety of natural forms fascinated Goethe all his life, and he became a scientist because he wanted to understand how nature worked. It was Goethe's special genius to bring poetic sensibility and insight to the observation methods and theorizing in botany, anatomy, and physics. And by poetic sensibility I do not mean that Goethe wrote beautiful poems about nature. In his botanical studies, for example, he followed exact scientific methods of observation, recording, and genetic experimentation in his garden at Weimar, and he traveled extensively to observe the

same plants in other climates and landscapes. But when he looked at the growing of a buttercup or a melianthus he saw not only its appearance, but also its metamorphosis through time and the larger environment in which it existed. Goethe used his poet's imagination to envision the principles of formation and change which allow an organism to develop. He was fueled by the desire to read in the book of nature: how the *life* of an organism and its *formative forces* find expression in leaf and bone. It led him to a deeper quest into the spirit of the natural world, and also to think more fully about the human soul.

His thinking and writing about nature and the psyche alienated Goethe from the prevalent scientific attitudes of his time and brought him into conflict with some of the fashionable nineteenth century German scientists and philosophers. Through an interesting bent of mind, he read philosophy and science intensively, but took them up in a very different way than most of his contemporaries. He studied Kant's *Critique of Pure Reason* in depth and was very excited about the philosopher's attempt to place aesthetic and scientific ways of knowing next to each other. But in a telling little anecdote Goethe recounts his discussions with Kant's followers: "it happened more than once that one or the other admitted with smiling amazement: it is clearly an analogy to Kant's way of thinking, but a very strange one" (von Goethe, 1982, p. 111).¹ His friend Schiller was probably one of the condescendingly smiling Kant pupils who, during their first walk together, insisted that Goethe's ideas were in the subjective mind and not in sensory experience, which annoyed Goethe and led him to the reply: "Well, so much the better; it means that I have ideas without knowing it, and can even *see them with my own eyes*" (SB 89). Goethe thought that Kant was, without doubt, the greatest thinker of his time, that his ideas had penetrated the deepest into German culture, and that they influenced even people who had never read a page in the philosopher's books (Eckermann, 1976). But Goethe also insisted that his own essay about the experiment (*Das Experiment*, in SB) undermined the central pillar of Kantian thought: the separation of subject and object, concept and percept.

Reading through Goethe's scientific writings and the documents connected with them we get the sense of a curious, far reaching mind which follows its insights and intuitions with courage and persistence, but which is also marked by a constant annoyance about the density of others, who do not see what he sees. Goethe was not a philosopher by training, but he had a philosophical mind. Neither was he a scientist or poet by training, but he had a scientific and poetic mind. And for him those qualities were deeply

connected and not so much different minds but *expressions of one mind* as it explored being in different ways. He never wrote a grand nature philosophy, and much of his scientific work was not completed and exists only in fragments, journal entries, or letters to friends. The difficult task facing a Goethe scholar is to bring these fragments together into a coherent form, without distorting Goethe's intention. Goethe's critique of the natural sciences is fragmented, but when seen through Husserl's *Crisis* Goethe appears as one of the prophetic voices who understood the danger of materialism, sensed the crisis in the sciences, and, like Husserl in his development of phenomenology, attempted to overcome the solipsism of the Kantian mind by faithfully recording his observations of natural phenomena and describing the activity of his mind. In the following I want to show that Goethe belongs in the phenomenological tradition for three reasons: he shared Husserl's deep distrust of the mathematization of nature; he understood that the phenomenologist must free him/herself from sedimented cultural prejudice; and he experienced that in the patient, participatory presence to phenomena the fullness of the world reveals itself in new and surprising ways.

II. Science and Experience

Through his experimental studies of light Goethe clashed violently with the ideas of Newton and the world view inherent in a Galilean-Cartesian science. The foundation of the modern natural sciences is the belief that mathematics is the foundation of all sciences and that all natural phenomena will ultimately be described in mathematical terms. The classical idea of a universal philosophy which can encompass all fields of knowledge has been replaced since Galileo by a belief in mathematics as the universal science (Husserl, 1970). Goethe sensed that there was a place for mathematics, but that it also could get in the way: "We must recognize and profess what mathematics is, where it can serve in scientific research, but also where it does not belong, and what sad aberrations science and art have suffered (since its regeneration) through its false application" (SB 145). Edmund Husserl, who was a mathematician and philosopher by training, had better tools than Goethe to articulate the philosophical implications of a mathematization of existence and by the time he wrote *The Crisis of European Sciences* (1954/1970) at the end of his life he had seen first hand the devastation technology had wrought and had witnessed the moral bankruptcy of the scientific, political, and religious institutions of his time. Instead of the unlimited progress the natural sciences had promised, Western culture

found itself in a “radical life crisis of European humanity,” (CES 2) with the sciences the handmaidens of totalitarian regimes justifying genocide and building the next generations of weapons of mass destruction. Goethe’s active and challenging optimism in taking on Newton had given way to Husserl’s courageous but quiet and subdued endurance when faced with the cultural results of a universal mathematical science. Both found their voices by taking a stand against the prevalent thinking of their time and by attempting to sensitize human consciousness to the mystery of everydayness once again.

Husserl’s challenge to the Galilean/Cartesian application of mathematics to all areas of life comes out of an in depth study of mathematics and its philosophical history. Galileo, looking through his telescope, recognized that the movement of the planets could be represented by mathematical symbols. Descartes elaborated this idea by defining that all things are “*res extensa*,” things of extension, which can be described mathematically. The idealized plane of geometry with its pure forms is extended to include the sensory world we experience, and the results are exciting and lead to great progress in the natural sciences and technology. But they are also devastating. Descartes’ *scientia mirabilis*, his miraculous mathematical science, opens up wonderful avenues for scientific exploration and technological invention; but large areas of scientific inquiry are excluded because they cannot be captured by mathematics. In Galileo we see already how the mathematically structured world of idealities is pushed upon us as the real and is substituted for our lived world. The mathematical “garb of symbols” (CES 51), which is only a method, is taken for true being.

While he is thinking through the Cartesian/Galilean worldview we can almost see Husserl do a double take as he catches sight of the strangeness of this perspective:

Everything which manifests itself as real through the specific sense qualities must have its *mathematical index* in events belonging to the sphere of shapes ... and that there must arise from this the possibility of an *indirect* mathematization ..., that is it must be possible to construct *ex datis*, and thus to determine objectively, all events in the sphere of the plena. The whole of infinite nature, taken as a concrete universe of causality—for this was inherent in that strange conception—became the object of a *peculiarly applied mathematics* (CES 37).²

Geometry, which is the paradigm for Husserl’s critique of the mathematical

attitude, must deduct all individual features from an observation, so that in the end we describe it through mathematical symbols: a room is no longer my office cluttered with the books, pictures, papers, and artifacts of my life, but a cube 8x12x10 in dimension, the same as all the other cubes down the hallway. Geometry captures the *quantitative* aspect of a space, but the *qualitative* element cannot be expressed in mathematical symbols. Goethe recognized this, as well:

The mathematician relies on the quantitative and everything that can be determined through number and measure, which capture the outwardly recognizable universe. But if we observe the universe with our whole being and with all our faculties (if that is possible to us), we recognize that quantity and quality are the two poles of existence as it comes to appearance. This is what goads the mathematician into pushing his symbolic language higher and higher to try to grasp through measure and number the immeasurable world. Now everything appears to him reachable, graspable, and mechanical... (SB 143-44).

Goethe accuses the mathematicians of having the arrogance to want to rule over everything as “universal monarchs” who declare “everything as worthless, inexact, and insufficient which cannot be submitted under their calculation” (SB145). Goethe saw that the qualitative aspect of existence could not be captured by measure and calculation, but this did not mean that there could not be a science of the qualitative. This qualitative science, however, had to have a different foundation than measure and number. It required different tools, and, moreover, a different consciousness and way of thinking. What Goethe shares with Husserl’s phenomenology is the attempt to create a clearing in which nature and the human mind can display the greatest range of phenomena besides those circumscribed by mathematics. For Goethe this meant to go beyond calculating intelligence (*Verstand*) and cultivate an imaginative, heart-felt reason (*Vernunft*) in his observations and experiments with natural phenomena. For Husserl it meant to develop a science which explores the *plenum* (or fullness) of being as it reveals itself to human consciousness.

III. Cultural Sedimentation

Besides the call for qualitative methodology, Goethe and Husserl share a deep distrust of the cultural forces which elevate a scientific method to an

ideology. Goethe recognizes that the language of mathematics has its own momentum: as soon as something is translated into it, it becomes something else. Scientific language has a peculiarly persuasive force. Because it is so arcane, those who understand it assume authority and are believed. Goethe warned his contemporaries that scientific ideas are not neutral, but that they have a profound impact on culture and history and that only a fine line separates science from ideology:

A false hypothesis is better than none; there is no danger in a false hypothesis itself. But if it affirms itself and becomes generally accepted and turns into a creed which is no longer doubted and which no one is allowed to investigate: this is the evil from which centuries will suffer (SB133).

Husserl calls this same phenomenon the historical “sedimentation of meaning”: the techniques and symbolisms of mathematics are applied and taken for granted, but its original meaning is forgotten and eventually distorted. Scientific inquiry becomes technologized and sediments into unquestioned cultural traditions and assumptions. Foucault’s insight that science is always ideology has its predecessors in Husserl’s analysis of the Western sciences and before that in Goethe’s sensibility. Phenomenology, after Husserl, always has had a double task: to unearth the cultural sedimentations and hidden motivations in our habitual assumptions about reality and to return to a faithful exploration of the fullness of being as it discloses itself to human experience. Husserl’s image for this process is appropriate: it is a “zig-zag” between cultural critique and experiential fidelity, between a hermeneutics of suspicion and a hermeneutics of affirmation.

IV. The Turning: Nature and Being

Goethe’s conflict with his Kantian friend Schiller highlights the gulf that separated Goethe’s world-view from most of his contemporaries. He thought that Schiller, like the other followers of Kant’s philosophy, had raised the human subject to great heights, but that he completely missed his own insertion into the natural world: “in the highest feeling of freedom and self determination, (he) was ungrateful against the great mother which had not treated him shabbily. Instead of regarding her as independent, alive from the lowest to the highest, and bringing forth things in lawful ways,

he took her up from a perspective of a few human natural features” (SB 88). Nature is not a mechanical construct following preset laws of causality. As Dietzfelbinger (von Goethe, 1982) points out, Goethe sees nature as a totality which expresses three principles in all its appearances: *form*, *matter*, *life*. Form is an active ideational force which shapes matter into its living appearance. If form is the idea, matter is the medium, and life is the appearance of this idea. They appear as a totality and cannot be separated from each other. This is why Goethe refused Schiller’s claim that his sketch of the metamorphosis of a plant was an idea and not an experience: for Schiller the idea existed only in the mind, while Goethe was convinced that he had experienced the idea through his disciplined contemplation of a series of natural phenomena. Ideas are not in the subjective mind, nor do they hover in a platonic realm above, but they disclose themselves to human experience through the discipline of a participatory imagination. Goethe’s nature poetry reiterates over and over that nature has neither core nor shell, neither inside nor outside. He insists that “one should not look behind the phenomena; they themselves are the lesson” (SB 77) and that we have to get used to the process of “looking for ideas in experience” (SB 46). Goethe is a phenomenologist not because he believes that there is nothing else but appearance, but because the phenomena given to human experience open up the wider realm of being and its lawfulness. “Nature” is Goethe’s term for *being*. Being discloses itself to him in its lawfulness as he consciously participates in the natural world.

The scientific definition of nature as a mechanistic, causal, and material universe reduces the full range of natural phenomena to the principle of *materiality* and omits the principles of *form* and *life*. Form and life become invisible to the scientific perspective, and in the two hundred years since Goethe they have almost completely dropped out of public scientific discourse. Who is still asking the question: what is life?

Husserl’s term for the infinity of the natural world which is under assault in the modern sciences is the word “plenum” (*Fuelle*). *Plenum* refers to the complex sensory qualities which are given to our perception as a total form. Color, sound, warmth, heaviness, spatial organization and temporal duration in their intersecting qualities are part of the plenum. Husserl insists that their qualitative web is destroyed when we dissect the plenum and assign its qualities as “sensory data” to specific sense organs: visual stimuli to the eye, sound waves to the ear, etc. In the world of experience the plenum is not chaotic, but already ordered. Beings depend on each other and change

in typical ways, inhabit the world in a particular manner, which Husserl calls their “invariant style”:

We can become explicitly conscious of this style by reflecting and by freely varying these possibilities. In this manner we can make into a subject of investigation the invariant general style which this intuitive world, in the flow of total experience, persistently maintains. Precisely in this way we see that, universally, things and their occurrences do not arbitrarily appear and run their course, but are *bound* a priori by this style, by the invariable style of the intuitable world. In other words, through a *universal causal regulation*, *all that is together in the world has a universal immediate or mediate way of belonging together*; through this the world is not merely a totality (*Allheit*) but an all-encompassing unity (*Alleinheit*), a *whole* (even though it is infinite). (CES 31)

All perception takes into account the unifying halo of the plenum, the horizon of the world, even though we are mostly unaware of it. When we adjust our perspective, a different aspect of the fullness of perception appears. Mathematics strives to construct a system of ideal forms analogous to the plenum with the hope of encompassing it completely. But the qualitative aspects of the plenum, like the intensity of warmth and coldness, roughness and smoothness, lightness and darkness are the key elements that constitute the particular style of a phenomenon and in principle cannot be quantified: there can be no measure exact enough to capture them.

Goethe and Husserl share a fundamental insight: the fullness of nature/ the plenum cannot be captured by sciences that are based on mathematics. But can there be a science which does make inroads into the “totality” and “encompassing unity” of the world we experience, a science which honors the qualitative element of our experience? In the answer to this question Husserl and Goethe diverge somewhat, partly because of differences in temperament, partly because of differing vocations, and partly because of maturing in different times.

Husserl, the philosopher, developed phenomenology as a systematic method to investigate the life world, i.e. the invariant structures of existence (like spatiality, temporality, embodiment, intentionality, thingness, etc.) in their fullness and interrelationship *as they appear to human consciousness*. His search for the transcendental ego is his attempt to posit a consciousness beyond the contents of perception, a mind which could grasp the totality

of being. Husserl saw himself as a critical Cartesian: he took up Descartes' insight that the only certainty we have is the certainty of our own thinking, but he corrected Descartes by showing that the structures of consciousness and its experience of the world are so much more complex and complicated than Descartes imagined. For him the *epoche*, which is a freeing of the mind from the culturally prevalent habits of thought, brought with it a strange change in consciousness, which he called a "new universal direction for our interest" (Husserl, 1954, p. 147) and he compared it to a religious "*Umkehr*" (turning/conversion) (p. 140). By consciously investigating the phenomena of life that we habitually take for granted the world changes before our eyes and reveals the mysterious lining of the world horizon (the *Allheit* and *Alleinheit* of the above quote) and the entwining of each thing with universal being: "World is the universal field into which all our experiencing, understanding, and doing acts are directed" (p. 147). To investigate the meaning structures of the plenum of the world as they reveal themselves to reflective consciousness became the task of phenomenology since Husserl.

Goethe, on the other hand, was not a philosopher, and he could take the abstractions of philosophical thinking only in small measure. In a letter to Schiller from February 19, 1802, he regrets, for example, that he cannot spend more time with the philosopher Schelling, whom he admires tremendously, but the speculative conversations between them drive Goethe outside to his nature studies to find an image (*Anschauung*) which can illustrate the philosopher's abstract thoughts. All this takes so much time and gets in the way of his poetic activity: "philosophy destroys my poetry" (SB 94). Goethe's path is not the philosopher's search for a universal philosophy of being, but to take the segment of the plenum which intrigues him most, the worlds of plants, animals, and elemental forces, and develop a phenomenology of the natural world through patient observation and self-observation. Like Husserl, he spoke of the change in consciousness which this kind of work requires in almost religious terms: the everydayness of life gets in the way of "the highest regions of consciousness," but we "still can harbor the pious wishes to lovingly approach the unreachable" (SB 91). He expressed the awe that overcame him when he finally saw the primal plant: "The immediate perception of archetypal phenomena put us into a state of fear, and we feel our insufficiency; only enlivened by the eternal play of the empirical world can they give us pleasure" (SB 78). Goethe carefully cultivated his consciousness so that it could see through the habitual, surface aspects of phenomena and capture more of their being. Like Husserl, he was aware of the interplay

between an individual thing and the universal field of being: “every existing being is an analogy of all existence: that is why *Dasein* appears separate and bound together at the same time” (SB 78). For him scientific observation could not get lost in the singular observation, but had to find ways of grasping the totality of a being’s world and then return to the individual phenomenon with a changed and deepened understanding.

When Goethe looked at the growth of a plant he not only recorded the various stages of its development, but he saw the formative principles which shape the plant as a totality: from seed to seedling, leaf growth to bud, flower to seed. Metamorphosis is not merely the outward change of a plant, but it describes the essential form a plant assumes *over time*. If you imagine the series of gestures a plant unfolds throughout its life in one image you have a picture of Goethe’s *Urpflanze* or primal plant. What you see is condensation and expansion, a spiral progression, refinement of form. But to your physical eyes the primal plant can never appear because your eyes cannot see the sequence of time, only its sedimentation in specific appearances. There is no primal plant in the physical, temporal world, because living beings are bound and changed by the flow of time. But in the human imagination the fullness of time can be grasped and represented. That is why Goethe saw the *Urpflanze* in the garden in Italy: through imaginative variation or what he called exact sensory imagination (*exakte sinnliche Phantasie*), he followed the total unfolding of a plant and grasped its essential, protean form in time. Goethe also called the formative force which realizes itself in a particular plant an *entelechy*, a term also used by Husserl to describe a form of being in which an idea is striving to become actualized (it can be a plant, but it also can be a historical/cultural impulse like the unfolding of self-awareness and reflexivity in Greek philosophy) (Husserl, 1970).

Husserl described the process of going beyond the objective, external examination of the world as *Innenbetrachtung*, i.e. an intensified and deepened contemplation of the structures of the world as they manifest in a particular phenomenon. Phenomenology, in Goethe and Husserl, is such an *Innenbetrachtung* and requires, as we saw before, a radical “*Umkehr*” or turning of our habitual way of seeing. Husserl writes:

All objective consideration of the world is consideration of the “exterior” and grasps only “externals,” objective entities. The radical contemplation of the world is a systematic and pure internal consideration of the subjectivity which “externalizes” itself in the exterior. *It is like the unity*

of a living organism which you can consider and dissect from the outside, but which you can understand only if you go back to its hidden roots and systematically follow the formative life force in all its achievements as it arises in the roots and strives upwards from them. (Husserl, 1954, p. 116, my translation and emphasis).

Husserl seems to refer here directly to Goethe's description of the archetypal plant, with which he was familiar.³ Husserl appropriates Goethe's method as an illustration for his own method of *Innenbetrachtung*, down to the term "formative life forces." But Husserl does not end his paragraph here. He continues:

But this is only a simile, and is not in the end our human being and the life of its consciousness with its profound world problematic the place where all problems of living inner being and external representation are to be decided? (p.116)

Husserl's phenomenology places the problematic of human consciousness and its world-constitution at the center of phenomenological inquiry, and most phenomenologists in the past century have done so as well. Goethe, on the other hand, offers a phenomenological method for a qualitative study of nature. It seems to me that phenomenology's "humanism" has reached its limits and that, once again, we are called to look beyond the human realm into life forms that are different and non-human. Perhaps there we can find a new foundation for an ethics which encompasses our responsibility for the entire natural world and fit ourselves into a larger circle of natural being. The simile of the plant and its life force may be more than a decorative turn of phrase: consciousness with its "profound world problematic" might be unable to decide the problems of being in solipsistic solitude. It is, after all, existing in and through a body, which ties it irrevocably to the natural world. Goethe's phenomenology of nature can give us a road-map of the territory the questioning mind encounters when it goes beyond itself.

Notes

¹ In the following, the references to von Goethe (1982), *Schriften zur Biologie*, are abbreviated as SB. All are my translation. References to Husserl, (1970) *The crisis in the European sciences* are abbreviated as CES.

² The underlying attitudes which characterize the Galilean/Cartesian worldview, ac-

ording to Husserl (1970), are the following: 1. Belief in progress and perfection. 2. Pure mathematical thinking goes beyond praxis and so can discover new abstract forms, which might or might not be verified in application. 3. Mathematics is no longer questioned in how its meaning is constituted; it becomes a habitual cultural attitude. 4. The activity of measurement is idealized and applied everywhere. 5. Geometry/ mathematics is the truth. 6. It is exact and overcomes subjectivism and relativism. 7. The world is objective and idealized. 8. We determine beforehand what the world is, we construct it in mathematical terms. 9. Time is measurable, the future is predictable. 10. Beings are identified as “*res extensa*,” and they are denuded of their particular individual features. 11. The mathematical sciences reach into and re-define all areas of human existence. 12. Mathematical thinking degenerates into an unreflective application of technology.

³ Husserl’s library included the following books which refer to Goethean science:

Benary, Wilhelm. *Von der Natur* (Erlangen, 1925), which is a compilation of various scientific essays by Goethe.

Kries, Johannes von, “Goethe als Naturforscher” (1920), which is a collection of lectures Otto, Rudolf, *Goethe und Darwin* (Göttingen, 1909), which is a compilation of papers.

Rotten, Elisabeth, *Goethe’s Urphänomen und die platonische Idee*. (Giessen, 1913), which seems to be a published dissertation.

References

- Eckermann, J. P. (1976). *Gespraech mit Goethe*. Muenchen: DTV.
- Heidegger, M. (1971). *Poetry, language, thought* (A. Hofstadter, Trans.). New York: Harper Colophon Books.
- Heller, E. (1959). Goethe and the idea of scientific truth. In *The disinherited mind*. New York: Meridian Books.
- Husserl, E. (1954). *Die Krisis der europaeischen Wissenschaften und die transzendente Phänomenologie* (Vol. 2). Haag: Martinus Nijhoff.
- Husserl, E. (1970). *The crisis of the European sciences and transcendental phenomenology* (D. Carr, Trans.). Evanston, IL: Northwestern University Press.
- Steiner, R. (2000). *Nature’s open secret. Introductions to Goethe’s scientific writings*. Great Barrington: Anthroposophic Press.
- von Goethe, J. W. (1982). *Schriften zur Biologie*. Muenchen/Wien: Langen Mueller Verlag.

Author’s note: Correspondence concerning this article should be addressed to Eva-Maria Simms, Department of Psychology, Duquesne University, 600 Forbes Avenue, Pittsburgh, PA 15282. E-mail: simms@duq.edu.