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The Duality of Goethe's Materialism

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The term materialism is rarely associated with Johann Wolfgang Goethe (1749–1832). Our most current specialized bibliography of secondary works on his oeuvre, the *Goethe-Bibliographie* of the Stiftung Weimarer Klassik, includes only four entries for the combined search “Goethe” and “Materialism/us,” none of which focusses on Goethe’s philosophical position, and the comprehensive *MLA International Bibliography* yields not a single result on these combined subjects. The *Germanistik Online Datenbank*, seminal for scholarship in German literature, yields only a handful of broadly-focussed studies, with scant consideration of materialism, and the exhaustive *Goethe-Wörterbuch* which records all individual instances of the 90,000 words in Goethe’s astounding textual vocabulary lists just one use of the word “Materialismus” in the 143 volumes of Goethe’s complete works, and this in the casual comment “the French renounced materialism and ascribed more spirit and vitality to the early ages.”¹ The sole occurrence of the word “Materialist” here is in the banal definition “Colonial products and spice merchants. Paper bags that the ‘materialist’ blows up before

1. *Weimarer Goethe-Bibliographie*; *MLA International Bibliography*; *Germanistik Online Datenbank* (all accessed Oct. 15, 2012). *Goethe-Wörterbuch* (Stuttgart: Kohlhammer, 2011), 5: 1502. Goethe’s original reads “Die Franzosen haben dem Materialismus *entsagt* [*italics mine*] und den Uranfängen etwas mehr Geist und Leben zuerkannt.” The word “entsagt” is missing from the quotation in the *Goethe-Wörterbuch*, whereas its cited source, *Goethes Werke* (Weimar: Böhlau, 1887–1919), 42.2, 187, includes it. All subsequent citations to the *Werke* are to this edition, unless otherwise specified. Unattributed translations throughout are those of the author.

he puts tobacco or coffee in them.”² Goethe did, however, use the words “Materialität,” “Materie,” “materiell” and derivatives of these often in his oeuvre, more than four hundred times according to the dictionary’s editors, including many brief references to aspects of science and the physical world, particularly the fields of physics, electricity, magnetism, light, and colour, though with only occasional brief connections to the philosophical thought of his age.³ It is not through the scholarly investigation of Goethe’s literary works that his contribution to the concept of materialism can be understood, but rather through works by others on the history of philosophy. Here he left an indelible mark, which is rarely taken into account and appreciated by literary scholars who generally see him as an anti-materialist, an author whose literary works are rich in symbolic allusion and spirituality, an immaterialist one could easily say. The following essay makes the case that literary scholars have generally neglected Goethe’s contribution to the exploration and understanding of the philosophical terms materialism and immaterialism, and it attempts to address this by describing his philosophical reception in the nineteenth and early twentieth centuries. It then traces Goethe’s understanding of materialism as derived from the ancient Greeks and his clash on that subject with the French materialist *Encyclopédistes*. It discusses then how Goethe’s reassessment of Newton’s theory of optics led him to an uniquely dualistic approach to materialism, combining it with immaterialism, which has maintained its importance even within the context of recent discussions of the philosophy of Johann Gottlieb Fichte (1762–1814), Georg Wilhelm Friedrich Hegel (1770–1831), and Immanuel Kant (1724–1804). The essay concludes with examples of the functioning of this dualistic concept of materialism and immaterialism in Goethe’s literary works.

It is important first to set Goethe’s place in the nineteenth- and early twentieth-century discourse on the history of philosophy. Friedrich Albert Lange’s *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart* (1865), a durable classic with a seventh edition in 1902, has been translated more than once into English, famously in 1877 by

2. “Kolonialwaren-, Spezereihändler. Papiertüten, die der Materialist aufbläst, ehe er den Tabak oder Caffee hineinthat.”

3. *Goethe-Wörterbuch*, 5: 1503–8.

Ernest Chester Thomas (1850–92) as *The History of Materialism and Criticism of Its Present Importance*, with a third edition introduced by Bertrand Russell (1872–1970) in 1925.⁴ The excellent index to this translation refers to Goethe a surprising sixteen times, putting him among the frequently cited authors in Lange's book. These sixteen references relate to a variety of Goethe's writings and intellectual relationships, including his poetry (1: 33), discussions with Friedrich Schiller (1759–1805; 2: 28, 142, 236), his opposition to the French Encyclopédistes (2: 96, 108, 148–50), his essays on painting (2: 108), his discussion of Baruch Spinoza (1632–77), Paul-Henri Thiry, Baron of Holbach (1723–89), and nature (2: 148–50), the Swiss biologist and poet Albrecht Haller (1708–77; 2: 218), his theoretical thoughts on idealism and materialism (2: 244–45), his morphology (3: 38), his essay "On Natural Science" ("Zu Naturwissenschaft im Allgemeinen," 3: 87), his death (3: 88), his epic poem "Hermann und Dorothea" (3: 331), the German poet Clemens Brentano (3: 193), and his aphorisms (3: 319). There is even a little jest about him near the end (3: 61n78). The lengthy section on Goethe, Spinoza and Holbach is introduced rather casually by the author with the phrase "as everybody knows"—the connection between its contents and Goethe's thought and oeuvre Lange considers obvious to everyone aware of philosophical trends, which attests to Goethe's prominent place in the nineteenth-century discourse on materialism. This section also closes the first part of Volume II of Lange's *History*, thus according Goethe the final word on a mammoth phase of the book's account of materialism from the ancient Greek atomists to Kant. The section on morphology begins with Lange's comment, "Goethe, whose Morphology may be regarded as one of the soundest and most fertile pieces of work done during the troubled age of our Philosophy of Nature, through his thoughtful study of the manifold forms and variations of the vegetable and animal world, had already attained the standpoint to which all our recent discoveries are forcibly carrying us"—an observation Lange obviously

4. Friedrich Albert Lange, *The History of Materialism and Criticism of its Present Importance*, Ernest Chester Thomas, trans., 3rd ed. (London: Routledge, Kegan and Paul, 1950). Libraries usually list the oddly-organized work as three volumes which makes more sense than "two books" ("Bücher") as there are in fact three separately-paginated clusters. The pagination references in this article use the three-volume approach.

still considered valid thirty-three years after Goethe's death.⁵ Finally, in Lange's chapter on "Theoretical Materialism, Ethical Materialism, and Religion" he includes one of Goethe's most famous aphorisms from his "Xenien":

He who has Science and Art,
He has Religion too;
Let him who in
These has no part
Make his Religion do!⁶

In this context, it is amusing to note that Lange's book mentions Karl Marx (1818–83) only incidentally, five times in all, a paltry presence when compared with Goethe's sixteen appearances and the emphasis on his contribution to understanding materialism. Yet Lange could hardly have anticipated the world-shaking political impact of Marx and Engels' materialistic philosophy in the following century. Goethe spent most of his life in Weimar, the heart of German classicism for scholars east and west, and became its uncontested champion. By the mid-twentieth century the city was at the same time the cultural heart of the German Democratic Republic. In GDR times, both the city of Weimar and the entire East German state idolized him as the role model of their classical heritage (klassisches Erbe) and the secular humanism they preached. Lange's work has remained widely respected internationally, as it was in East Germany, but surprisingly, the socially-skewed literary scholarship of that state failed to recognize and exploit Goethe's place in the history of materialism, the philosophical foundation of their country.

Goethe's theoretical knowledge of materialism as a formal philosophical movement stemmed from his acquaintance with the works of the ancient Greek Democritus (ca. 460–370 BCE) and the Roman Epicurean philosopher Titus Lucretius Carus (94?–55 BCE). Basic to Democritus's materialism was his atomic theory. Following in the footsteps of Leucippus, Democritus held that everything is composed of atoms which are physically, but not geometrically, indivisible; that

5. Lange, *History*, 3: 38.

6. Lange, *History*, 3: 319. Goethe's original is "Wer Wissenschaft und Kunst besitzt / Der hat Religion; / Wer diese beiden nicht besitzt / Der habe Religion!" See "Zahme Xenien," Goethe, *Werke* (Hamburg: Wegner, 1959–60), I: 367.

between atoms lies empty space; and that atoms are indestructible, always in motion, and of infinite variety. He believed that everything was the result of natural laws, and hence he was a strict determinist and materialist. Teleological questions of cause, reason, or purpose for this state were of no concern to Democritus as he explained the world only mechanistically, that is, by the laws of cause and effect.⁷ While his theory is generally held to be more consistent with the science of the eighteenth century than any other, it lacked an empirical basis, something that Goethe required to be convinced. That empirical basis was provided in large part by Isaac Newton (1642–1727) in his *Opticks* of 1704, which Goethe critiqued and modified in his *Theory of Colours* (*Zur Farbenlehre*) of 1810 and surrounding writings.⁸

In terms of classical influence, it was Lucretius's *De rerum natura* (*On the Nature of Things*) that was most attractive to Goethe's sense of the material and immaterial. In this he was encouraged by his friend Karl Ludwig Knebel (1744–1834), who published a translation of Lucretius's treaty in hexameters in 1821. At one point Goethe planned to write a commentary on Lucretius, but while this never came to fruition, his glowing review of Knebel's translation makes clear his enthusiasm for both the translation and its subject.⁹ Goethe made frequent reference to Lucretius's oeuvre in his own works. Of particular note is the fact that his long poem "Metamorphose der Tiere" ("Metamorphosis of Animals") was also composed in hexameters and contains many references to Lucretius's seminal work, as Hugh Barr Nisbet has explored.¹⁰ In *On the Nature of Things*, in poetic form and language, Lucretius's primary purpose was to demonstrate that the soul is mortal and the world is not governed by gods but by mechanical laws. He argued empirically for the original atomist theory, observing that all material is subject to decay and hence permanent change. Rocks are worn down in time by drops of water and mix together to

7. C.C.W. Taylor, "Democritus," in *Routledge Encyclopedia of Philosophy Online* (accessed October 14, 2012); George J. Stack, "Democritus," *Routledge Encyclopedia of Philosophy*, ed. Edward Craig (London: Routledge, 1998), 6: 170–73; and Sylvia Berryman, "Democritus," in *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta ed. (accessed Oct. 14, 2012).

8. Goethe, *Werke*, 2: 5.1.

9. Goethe, *Werke*, 1: 41.1, 361–65.

10. "Lukrez," in Bernd Witte *et al.*, *Goethe-Handbuch* (Stuttgart: Metzler, 1996–99), 4.2: 673.

create new material forms. Objects decay and become a variety of new substances. But other objects, like seeds, contain not the substance but the essence of new and different life, growing into plants and trees. Lucretius concluded that many properties of materials derive from something inside that stores the same inherent, indivisible properties, producing an endless cycle of nature. But he was left with the basic question as to why everything in the world has not yet decayed, and how the same materials, plants, and animals can be recreated again and again? One answer was that indivisible properties are conveyed in a way not easily visible to human senses; that is, they assume a mysterious generative force.¹¹ This theory pointed to teleological questions and paths of inquiry, the kind that were essential to Goethe's science and his poetry. This classical foundation in atomic theory carried with it a fundamental dualism of the material and the immaterial, the same as Goethe's own approach.

It was the French Encyclopédistes who engaged Goethe on the question of materialism most forcefully in his own age, primarily through the writings of the Baron d'Holbach (1725–89). Holbach was born in the Rhenish Palatinate, but emigrated to Paris, establishing residence and an influential salon there for intellectuals of the age. He himself authored and translated a large number of articles on topics ranging from chemistry and minerology to politics and religion, all subjects that intensely interested Goethe and on which he wrote voluminously. Holbach was a dedicated materialist, and also an confessed atheist, a combination which the late eighteenth-century German intelligentsia had difficulty accepting, in public at least. Holbach's anti-Christian materialist writings—for example *Christianisme dévoilé* (*Christianity Unveiled* 1761), *La Contagion sacrée* (*The Sacred Contagion* 1761), and *Théologie portative* (*Portable Theology* 1768)—offended Goethe particularly, even if he had his own doubts about Christian theology and its deity. Goethe launched his sharpest published counter-attack on Holbach's *Le Système de la nature* (*The System of Nature* 1770) which went beyond his other anti-Christian writings to deny the existence of a deity of any kind, rejecting all teleological arguments

11. Michael Erler, "Lucretius," *Routledge Encyclopedia of Philosophy Online* (accessed Oct. 14, 2012); "Lucretius," *Routledge Encyclopedia of Philosophy*, 5: 854–56; and David Sedley, "Lucretius," *The Stanford Encyclopedia of Philosophy* (accessed Oct. 14, 2012).

and insisting on the supreme and sole existence of matter in motion and the inexorable natural laws of cause and effect, just as Democritus had done before him. This attack on nature exceeded Goethe's tolerance.

Soon after Holbach's book appeared it drew the attention of Johann Gottfried Herder (1744–1803) and the young Goethe in Strassburg, as Goethe recalled in his autobiographical *Fiction and Truth* (*Dichtung und Wahrheit*, 1814). They too were intensely preoccupied with the concept of nature, but they were so appalled by Holbach's *Système de la nature* that neither actually finished the book.¹² After all, their goddess Nature had been reduced by Holbach to a mechanistic process. They referred to Holbach as “a decrepit old man ... sinking into the grave,” locked in a philosophy of the past. Holbach had nothing to say to them about the nature of the organic, of entelechy, of poetic creation, or of teleology.¹³ Despite their fundamental disagreement with his position, Holbach's work was nevertheless productive for them, as they described ironically: “If, after all, this book did us any mischief, it was this—that we took a hearty dislike to all philosophy, and especially metaphysics, and maintained that dislike; while, on the other hand, we threw ourselves into living knowledge, experience, action, and poeticising, with all the more liveliness and passion.”¹⁴

Goethe's experiments and observations in natural science are still ranked as important contributions to the development of numerous fields including anatomy, botany, climatology, geology, morphology, and optics. It is in optics that his achievements are perhaps best known, and in that field he ranks with Newton as the two most important scientific contributors between the late seventeenth and mid-nineteenth centuries. Expanding Newton's theory of light and colours, Goethe introduced the entirely new elements of darkness and shade and thereby corrected and disproved some of his predecessor's

12. Goethe, *Werke*, 1: 28, 69.

13. Goethe, *Truth and Poetry: From My Own Life*, trans. John Oxenford, (London: George Bell, 1891), 1: 424. “Qintessenz der Greisheit, ... grau, cimmerisch, und totenhaft”; “innewohnende, zielgerichtete Kraft”; Goethe, *Werke*, 1: 28, 69.

14. Goethe, *Truth*, 1: 425. His original: “Wenn uns jedoch dieses Buch einigen Schaden gebracht hat, so war es der, daß wir aller Philosophie, besonders aber der Metaphysik, recht herzlich gram wurden und blieben, dagegen aber auf's lebendige Wissen, Erfahren, Thun und Dichten uns nur desto lebhafter und leidenschaftlicher hinwarfen.” Goethe, *Werke*, 1: 28, 71.

findings. In his *Theory of Colours* (*Farbenlehre* 1810), Goethe addressed Democritus's atomism directly, responding to the Greek's view that the essence of life is evident in the factual existence of atoms, of which all reality is composed, and accordingly the perception of the phenomenon of colours as well. Hence, Democritus maintained that the *process* of sensual perception should be relegated to secondary status. In the historical introduction to his *Theory of Colours*, Goethe described Democritus's theory in some detail as part of a review of the contribution of the ancient Greeks, as well as other ancient philosophers, to this avenue of research.¹⁵ Goethe concluded, "Democritus and his disciples ascribe everything to chance, lawlessness, mechanical conception. To be seen as a crude symbol."¹⁶ He himself saw the existence of colour not as an entity in itself but as the result of the processing of atoms through the eye into the human brain.¹⁷ He considered Democritus's explanation superficial, for it ignored what he understood to be an immaterial, even mystical process, namely, the relationship between light and the human eye, which produced the perception of colour. Goethe's thinking here influenced not only the science of optics, but also the course of western philosophy. As Bertrand Russell (1872–1970) writes,

What we see depends not only on what there is to be seen, but also upon the eye, the optic nerve, and the brain. But the eye, the optic nerve, and the brain are only known through being seen by the physiologist. In this way materialism is driven back to sensationalism. If it is to escape sensationalism, it must abandon the empirical scientific method, substituting it for the dogmatism of *a priori* metaphysic, which professes to know what is behind appearances.¹⁸

Although he saw himself as a scientific empiricist, Goethe's thinking on this subject lies somewhere beyond that, as Bertrand Russell described. It lies in the realm of metaphysics, which becomes most evident when we turn in a moment to examples of its expression in his poetry, prose, and drama.

15. Goethe, *Werke*, 2: 3, 4–6. See also *Werke*, 2.3: 11, 12, 16, 111, 112, 392.

16. "Democrit und seine Schüler schreiben alles dem Zufall zu. Gesetzlosigkeit. Mechanische Vorstellung. Als ein crudes Symbol anzusehen"; Goethe, *Werke*, 2.3 392.

17. Goethe, *Werke*, 2.1: 31.

18. Lange, *History*, xi.

When speaking of the material and immaterial, we must be careful of our terminology. While 'material' may be assumed simply to be that associated with the physical realm, the philosophical discussion of it is much more complicated than that, and the precise term 'material' is often avoided or left out of the discussion. The eighteenth-century 'pantheism controversy' is a case in point. As John Zammito describes, it arose in August 1785 with the publication of Friedrich Jacobi's (1743–1819) treatise on Gotthold Ephraim Lessing's (1729–81) alleged Spinozism and atheism, to which Lessing's friend Moses Mendelssohn (1729–86) replied. A debate involving others ensued, with the three focal points being Lessing's religious loyalties, the proper exegesis of Baruch Spinoza's (1632–77) philosophy, and the fundamental authority of reason. The debate led inevitably to Kant.¹⁹ Jacobi, Mendelssohn, and Kant saw Spinozism as mechanistic, atheistic, and fatalistic, a dangerous path toward nihilism, while Herder, Goethe and other idealists saw his idea of intrinsic infinity as a positive holism. This interpretation of Spinoza resulted in a new concept of pantheism, a new metaphysics of immanent reason, which strongly influenced the development of Goethe's own philosophical position through his scientific research in the natural world, particularly in the fields of optics and morphology.²⁰

The concept of the 'immaterial' is more difficult. In Goethe's case, this has been called by reliable scholars, in German, the realm of "Bewußtsein, Geist" and "Vernunft," consciousness, spirit, or even reason, which are functions of the world of matter but an entirely different dimension of reality.²¹ Modern scholars of philosophy have continued Lange's investigation of Goethe and the materialism/immaterialism duality and attempted to refine our understanding of the overlap between the two. Among the leaders is Eckart Förster, first with his article on "Goethe and the 'Auge des Geistes' [Eye of the Spirit]."²² Here, Förster investigates the philosophical significance of Goethe's

19. John H. Zammito, *The Genius of Kant's Critique of Judgment* (Chicago: University of Chicago Press, 1992), 228.

20. Zammito, *Genius*, 229–30.

21. See Martin Bollacher's "Materialismus," which directs the reader to the major sources of Goethe's discussion of materialism in his oeuvre, in Witte et al., *Goethe-Handbuch*, 4.2: 689–91.

22. Eckart Förster, "Goethe and the 'Auge des Geistes,'" *Deutsche Vierteljahrschrift für Literaturwissenschaft und Geistesgeschichte* 75 (2001): 87–101.

frequent use of the term ‘eye of the mind’ and the role it plays in the context of his scientific methodology as well as Goethe’s lifelong belief that a sense now lost in most people can be trained to ‘see’ what is spirit in nature, in other words, see the immaterial in the material, though Förster does not use these exact terms.²³ Förster bases his argument on Goethe’s writings on morphology and optics, linking Goethe’s thought to other philosophers of his age, particularly Fichte, Hegel, and above all Kant. As a key to understanding Goethe’s interpretation of Kant, indeed his Kantianism, despite fundamental differences he had with Kant in interpreting phenomena, Förster cites Goethe’s famous meeting with Schiller after a meeting of the Jena Society for Scientific Research in July 1794 which established their differences on the philosophical notion of the ‘idea.’ Schiller voiced his Kantian position, namely that “an idea is a concept of reason to which no corresponding object can possibly be given in sense experience,” to which Goethe countered that he had ideas that he could see with his own eyes. That step was in essence Goethe’s blurring of the line between the immaterial and the material, making nature “flexible and plastic,” and proposing that continuous practice of this process could lead to “the evolution of a new sense organ.”²⁴

The Goethe Society of North America *Yearbook* of 2011 contains a special section devoted to examining Goethe’s role in some of the central philosophical developments of German Idealism. In their introduction, editors Elizabeth Millán and John H. Smith report that Goethe’s interest in Kant has most recently been addressed by Eckart Förster in his writings on teleological judgement, pointing out the intersection between Goethe’s and Kant’s work:

Förster highlights two paragraphs, §§76 and 77 of the *Critique of Judgment*, that piqued Goethe’s interest and opened up avenues that moved beyond Kant himself. After all, it was there that Kant raised the possibility of an “intuitive intellect,” an *intellectus archetypus*, that could grasp the kind of teleological unity-in-diversity that makes living organisms unique and might even provide a model for all of nature as itself a

23. Förster, “Goethe,” 87.

24. Förster, “Goethe,” 90–98. See also a detailed account of this meeting between Goethe and Schiller in David G. John, “The Partnership,” *Friedrich Schiller. Playwright, Poet, Philosopher, Historian*, Paul E. Kerry, ed., *British and Irish Studies in German Language and Literature* 38 (Oxford: Lang, 2007), 181–201.

living organism. Whereas Kant denied this faculty to humans, whose reason could only proceed discursively, such intuitive knowledge was at the heart of not only Goethe's poetic and scientific thought, but also ... at the heart of his very sense of self.²⁵

A year later Förster published *The Twenty-five Years of Philosophy*, in which he sets Goethe's Kantianism into the context of his age, and indeed the history of western philosophy.²⁶ Its bold title in effect makes the claim that the two and a half decades it considers (i.e. from Kant to Hegel) were seminal for the history of philosophy. The book's extraordinarily frequent references to Goethe, in fact on 71 of its 312 pages, and inclusion of an entire chapter on Goethe entitled "The Methodology of the Intuitive Understanding," ranks the poet as a contributor alongside other focal figures—Spinoza, Kant, Fichte, Schelling, and Hegel—in the development of the philosophy of the period. Förster's chapter on Goethe explains his contribution to the evolution of philosophy through his "Essay on the Metamorphosis of Plants," "Contributions to Optics," "The Experiment as Mediator between Object and Subject," "Morphological Notebooks," and "Theory of Colours," and Goethe is given the final word by Förster as he establishes the thesis behind his book's title:

If the physicist can attain to knowledge of what we have called an *Urphänomen*, he may rest secure and the philosopher with him; *he* is secure because he can convince himself that he has reached the limit of his science, that he is standing at the empirical summit from where he can gaze back and survey all the stages of his experiments, and gaze forward into the realm of theory into which, though he may not enter, he still may peer. And the philosopher is secure since from the hand of the physicist he takes a final result that in his own becomes a starting point.

Förster comments, "With this phrase Goethe states why philosophy need not come to an end even after the completion of its history ... the systematic ordering of all ideas derived from *Urphänomene* would

25. *Goethe Yearbook*, 18: 5. See also Immanuel Kant, *Critique of the Power of Judgment*, ed. and trans. Paul Guyer (Cambridge: Cambridge University Press, 2000), 271–79.

26. Eckart Förster, *The Twenty-five Years of Philosophy*, trans. Brady Bowman (Cambridge, MA: Harvard University Press, 2012).

constitute a metaphysics of the future.”²⁷ The word or concept “Materialism” as a formal philosophical movement has no place in Förster’s book, but Goethe’s contribution can certainly be understood as an adjustment to the philosophy of perception to include both the physical and the abstract worlds, in the terminology of the present inquiry, the material and immaterial.

As a natural scientist, Goethe had to be a materialist to some extent as well, but for him “material never exists without spirit, spirit never without material”; in other words, materialism must include immaterialism at the same time.²⁸ Goethe’s linking of his *Theory of Colours* to mystical phenomena could be called a scientist’s step from the material into the immaterial world. Interplay between the two realms is frequently present in his lyrical works. Striking examples of this duality run throughout such poetic cycles as the great hymns of his early Storm and Stress period in the 1770s. Examples are “Wandrer Sturmlied,” “Mahomets Gesang,” “Prometheus,” “An Schwager Kronos,” and the *West-östlicher Divan* of 1814–15, whose depiction of human relationships and natural imagery are infused with oriental mysticism. The best examples, however, are probably the poems which directly link his anatomical and botanical research to his lyrical descriptions of plants and animals. “The Metamorphosis of Plants” (“Die Metamorphose der Pflanzen”) is one that paralleled a rich set of his scientific sketches depicting the growth of a plant from seed to maturity. While the drawings show the physical, material genesis, the poem includes the immaterial internal driving force that causes those changes, and which is described in dramatic terms. A metaphysical force is present from the start: “So to a secret law surely that chorus must point, to a sacred enigma.”²⁹ The seed itself contains an immaterial power that drives the process of formation: “Simple, dormant, the power in the seed; the germ of an image, contained in itself it lay there.” Within the species there is infinite variation – “not always the same, though; but manifold does it emerge.” This cannot be explained in material terms but rather

27. Förster, *Twenty-five Years*, 371. The original quotation is from Goethe’s *Theory of Colours* (*Farbenlehre*), *Werke*, 2.1, 287.

28. “Die Materie existirt nie ohne Geist, der Geist nie ohne Materie”; Goethe, *Werke*, 2.11, 11.

29. “Und so deutet das Chor auf ein geheimes Gesetz, / Auf ein heiliges Rätsel”; Goethe, *Werke* (Hamburg: Wegner, 1959–60), 2: 199–201, ll. 6–7.

by the presence of the external controlling force of Nature alongside an internal power: "With powerful grip does Nature then form it, Guiding it gently to find its fulfilment complete." The internal power of the emerging form is then itself described in monotheistic terms: "The colourful leaf is then touched by God's hand ... Every plant then gives voice to the laws that have that shaped it."³⁰

Goethe's parallel poem, "Metamorphosis of Animals" ("Metamorphose der Tiere"), which includes allusion to his discovery of the intermaxillary bone, a lasting contribution to the science of anatomy, expresses a similar symbiosis between the material and immaterial worlds with repeated interpolations describing Nature's authority: "She, the ultimate law, determined the path of each being;" and "Every component is fashioned by laws without end." Again the living object is driven by an internal force: "For deep within lies the force of these noble creations ... deep within lies a spirit striving with all of its force." The poet encourages us to examine the form and this process of growth "in the spirit of science and research," content with the tensions of combining the material and immaterial worlds.³¹ The combination of the two is in frequent evidence in many of Goethe's prose works as well, most strikingly in the clash between the emotions of Werther and their spiritual links to the forces of Nature and the quotidian reality of the bourgeois world in *The Sorrows of Young Werther* (*Die Leiden des jungen Werthers*, 1774), and also in the mystical reproduction motif in his later, mature novel *Elective Affinities* (*Die Wahlverwandtschaften*, 1809).

Finally, Goethe's *Faust* provides a prime example of this dualistic materialism in combination with Newton's optics. In his ruminations on the genesis of *Faust*, Goethe wrote in *Fiction and Truth* of the figure of Lucifer, one component of the negative force that beleaguers Faust's

30. "Einfach schlief in dem Samen die Kraft; ein beginnendes Vorbild / Lag, verschlossen in sich." (ll. 15–16); "Zwar nicht immer das gleiche; denn mannigfaltig erzeugt sich" (l. 25); "Doch hier hält die Natur, mit mächtigen Händen, die Bildung / An und lenket sie sanft in das Vollkommnere hin" (ll. 33–34); "Ja, das farbige Blatt fühlet die göttliche Hand ... Jede Pflanze verkündet dir nun die ew'gen Gesetze" (ll. 50, 65).

31. "Sie das höchste Gesetz beschränkte jegliches Leben" (l. 7); "Alle Glieder bilden sich aus nach ew'gen Gesetzen" (l. 14); "Doch im Innern befindet sich die Kraft der edlen Geschöpfe ... Doch im Inneren scheint ein Geist, gewaltig zu ringen ..." (ll. 29, 33); and "mit forschendem Geiste" (l. 42).

striving to escape the constraints of human existence: "From this concentration of all creation, which began with Lucifer and followed his laws, emerged then all we perceive as material, which we find heavy, solid, and dark, but which, even if indirectly, stems from an affiliation with a godly presence, and is thereby empowered forever as part of an ancestral line."³² The material world is acknowledged as a primal force beside God and the spiritual realm. The opening act of *Faust II* ends with a famous image combining both. Faust stands on Greek soil—a physical link to his classical predecessors, Democritus and Lucretius—and as the dawn of light appears, witnesses the colours of a spectacular rainbow. Light, symbolizing spirit (*Geist*), alludes to Goethe's *Theory of Colours* and Newton's *Opticks*, but also the atomism of the ancient Greeks:

Behind me only the shining sun!
 The cataract that through the cleft rock roars
 To ever mounting rapture has me won;
 From plunge to plunge it overflows and pours
 Itself in thousands and uncounted streams
 While high in air mist-veil on mist-veil soars.
 But O how glorious through the storm there gleams
 The changeless, ever changeful rainbow bent,
 Sometimes distinct, sometimes with shattered beams,
 Dispensing showers of cool and fragrant scent.
 Man's effort is there mirrored in that strife.
 Reflect and by reflection comprehend:
 There in that rainbow's radiance *is* our life.³³

32. "Aus dieser Concentration der ganzen Schöpfung, denn sie war von Lucifer ausgegangen und mußte ihm folgen, entsprang nun alles das, was wir unter der Gestalt der Materie gewahr werden, was wir uns als schwer, fest und finster vorstellen, welches aber, indem es wenn auch nicht unmittelbar, doch durch Filiation vom göttlichen Wesen her stammt, eben so unbedingt mächtig und ewig ist, als der Vater und die Großeltern"; Goethe, *Werke*, 1.27: 219.

33. Goethe, *Faust. Part One & Part Two*, trans. Charles E. Passage (Indianapolis: Bobbs-Merrill, 1965), ll. 4715–27. Goethe's original: "So bleibe denn die Sonne mir im Rücken! / Der Wassersturz, das Felsenriff durchbrausend, / Ihn schau' ich an mit wachsendem Entzücken. / Von Sturz zu Sturzen wälzt er jetzt in tausend / Dann abertausend Strömen sich ergießend, / Hoch in die Lüfte Schaum an Schäume sausend. / Allein wie herrlich, diesem Sturm entspringend / Wölbt sich des bunten Bogens Wechsel-dauer / Bald rein gezeichnet, bald in Luft zerfließend, / Umher verbreitend duftig kühle Schauer. / Der spiegelt ab das menschliche Bestreben. / Ihm sinne nach und du bgreifst genauer: / Am farbigen Abglanz haben wir das Leben."

What is the “rainbow’s radiance,” Goethe’s famous “farbiger Abglanz,” the “changeless, ever changeful rainbow bent,” the climax of this visual spectacle? In scientific terms it is the light of the sun refracted through particles, the atoms in the droplets of water, the physical matter in the air. Earth’s atmosphere has become a prism for the spiritual source.³⁴ The atomic philosophy of Leucippus and Democritus merges with the poetic description of Lucretius from ancient times, and with the optical experiments of Newton and Goethe. A similar phenomenon occurs in the famous final Helena scene of *Faust II*, Act 3, as this symbol of classical female perfection dissolves and floats upward as a cloud, or in scientific terms is transformed into atomic particles to form droplets which in turn collect in visible form. The physical assumes aesthetic and spiritual dimensions. Goethe’s own research on cloud formation and contributions to the international field of cloud theory naturally come to mind.³⁵

By way of his philosophical roots in the materialism of the ancient Greeks, his contribution to modern science in the re-assessment, correction and expansion of Newton’s *Opticks*, his rejection of the Encyclopédistes who supported a mechanistic materialistic philosophy and eschewed all teleological connections, and his own many further scientific experiments and findings which remain important to their fields, Goethe developed a new philosophical interpretation of the concept of materialism which incorporated both physical and spiritual spheres.³⁶

Goethe, *Werke*, 3.149: 4715–27. See also Gert Mattenklott in “Faust II,” *Goethe-Handbuch*, 2: 398.

34. See also Mattenklott, *Goethe-Handbuch*, 2: 413.

35. See particularly Goethe’s “Theory of Clouds” (“Wolkentheorie”) and many drawings and charts demonstrating his experiments in the field of meteorology; Goethe, *Werke*, 2.12.

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