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FREEING THE PHENOMENA:  
GOETHEAN SCIENCE AND THE BLINDNESS OF FAUST

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The phenomena must be freed once and for all from their grim torture chamber of empiricism, mechanism and dogmatism. (Goethe 1988, 309)

On 17<sup>th</sup> November 1784 Goethe wrote to his friend and former tutor Ludwig Knebel in some excitement. He had just finished writing an account of his discovery of the human *os intermaxillare*, a small section of bone in the upper jaw, found in apes and other mammals, but not, hitherto, in humans.<sup>1</sup> Goethe also had a hand-written copy of this account forwarded to the famous Dutch anatomist Pieter Camper, who dismissed his findings, as did the biologist Soemmering and the paleontologist Blumenbach. Perhaps this is not surprising. After all, in the comparative anatomy of Goethe's day, man's presumed lack of an intermaxillary bone was widely cited as definitive evidence of the great divide allegedly separating humans from animals. It is indeed for precisely this

reason that Goethe was so overjoyed by his momentous discovery. For, as he stressed in his letter to Knebel, this seemed to him to prove the close kinship of humans and animals and the underlying unity-in-diversity of the natural world, in which each entity was “only a tone, a shade in a great harmony that must be studied as a whole”. (Goethe 1949, 813; my trans.)

As it turned out, Goethe’s discovery was proved correct, although it appears that he may not in fact have been the first correctly to identify what would later be recognized as a ‘residual’ intermaxillary bone in the human jaw. From a contemporary ecological perspective, however, the significance of Goethe’s scientific work lies not so much in ‘discoveries’ of this kind, but rather in the underlying philosophy of nature and method of investigation which guided his researches. Goethe’s contribution to the creation of a more holistic understanding of the natural world has been acknowledged in several accounts of the emergence of ecological thought.<sup>2</sup> Recently, some in-depth studies of Goethean science have also begun to appear, such as the excellent volume edited by David Seamon and Arthur Zajonc (1998), in which Goethe’s way of science is hailed as a model for a new ecological “phenomenology of nature”.<sup>3</sup> According to Seamon in his introduction:

Goethe’s method teaches a mode of interaction between  
people and environment that involves reciprocity,

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<sup>1</sup> “An Intermaxillary Bone Is Present in the Upper Jaw of Man As Well As in Animals” (Goethe 1988, 111-6). This essay was first printed in Jena in 1786.

<sup>2</sup> E.g. Worster, 82f.; Marshall, 287; Fritjof Capra, 21-3.

<sup>3</sup> The most substantial new study of Goethean science is to my knowledge Bartoft’s. An ecological concern also underpins the essays by G. Böhme, G. Altner and K. M. Meyer-Abich in Frederick Amrine *et al.* See also the essays by Hartmut Böhme, Gernot Böhme (1989) and Isis Brook.

wonderment and gratitude. He wished us to encounter nature respectfully and to discover how all its parts, including ourselves, belong. In this way, perhaps, we come to feel more care for the natural world, which answers back with meaning. (10)

As I will go on to explain, there are indeed good grounds for such an ecological actualization of Goethean science. Nevertheless, I fear that in the new green enthusiasm for Goethe's approach to the natural world, there is a risk that an appreciation of the inevitable historical limitations of some of his assumptions and attitudes could be lost. In this article, then, I would like to address both the actuality and the insufficiency of Goethean science. For it is only thus that we may truly honor Goethe's achievements while simultaneously acknowledging the singularity of our own historical situation of global ecological imperilment, and the radically new kinds of understanding that this necessitates. As I will be arguing that Goethean science belongs, however uneasily, to the wider movement of romantic *Naturphilosophie* and natural science, I hope that this study will also shed further light on the question raised by Ralph Pite in the ecocritical edition of *Studies in Romanticism: 'how Green were the Romantics?'* (1996). In the case of Goethe, I believe that the potential insight, as well as residual blindness, of 'green romanticism' are revealed nowhere more fully than in the second part of *Faust*, and it is to this extraordinary text that I will turn in conclusion.

The breadth and depth of Goethe's scientific studies were truly remarkable in a self-professed amateur. In addition to his major works on plant and animal morphology

and his three-part treatise on chromatics, the infamous *Farbenlehre* of 1810, Goethe also wrote on geology, meteorology and the history and philosophy of science, as well as taking a lively interest in metallurgy, magnetism, chemistry and electricity, or 'galvanism' as it was then known. It should nonetheless be observed that interest in science ran high among the educated classes in Europe at this time. It was certainly shared by many writers and philosophers of the romantic period. Indeed, however else this notoriously nebulous phenomenon might be understood, romanticism has become a focus of intense ecocritical interest today precisely in its interweaving of certain philosophical, scientific and mytho-poetic discourses on nature. This romantic conjunction is now seen to have been pivotal to the second 'scientific revolution' of the early 19<sup>th</sup> century, which in many respects challenged the underlying assumptions of the earlier scientific revolution of Bacon, Descartes and Newton. However, this second revolution in scientific thought and practice also ushered in a process of increasing professionalisation and specialization whereby some of the most valuable insights of romantic science generally, and Goethean science in particular, were suppressed.<sup>4</sup>

If the mechanistic model of 17<sup>th</sup> and 18<sup>th</sup> century science effected, in Carolyn Merchant's influential turn of phrase, the 'death of nature' (1980), at least in theory, then romantic science might be said to have engendered its 'rebirth'. Although Goethe came to distance himself from the younger generation of romantic scientists and writers, his philosophy of nature is in many ways congruent with theirs. Goethe's own youthful enthusiasm for Nature in his *Sturm und Drang* period was in fact a major influence on younger writers such as Tieck, Novalis and the Schlegels. Goethe nonetheless became

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<sup>4</sup> On the role of romanticism in this second scientific revolution, see e.g. the introduction

increasingly critical of the self-projection involved in the mode of ecstatic identification with a heavily idealized, and hence abstract, Nature which he represented in his best-selling novel *The Sorrows of Young Werther* (1774). It is for this reason that, following his appointment to the Court at Weimar in 1776, he turned instead to the close observation of the concrete particulars of the natural world, as a preferable mode of seeking understanding both of nature as a plurality of embodied others and, ultimately, of the embodied self. Goethe's more mature and scientific appreciation of natural phenomena nonetheless remains in dialogue with romanticism. In particular, Goethean science resonates with the thought of Germany's preeminent romantic philosopher of nature, Schelling, whom Goethe in fact helped secure a professorship at Jena in 1798.<sup>5</sup> Like many of the younger romantics, Goethe took his first steps along the path of overcoming mechanistic reductionism with the assistance of the Renaissance alchemists, whose residual animism and theory of correspondences provided an important model for the romantic vision of the natural world as whole and ensouled. For Goethe, as well as for some of his younger contemporaries, the philosophies of Leibniz and above all Spinoza were also valuable in enabling them to reconceptualize the natural world as the living locus of divine immanence, rather than as the clock-work creation of a *deus absconditus*. Renaissance neo-platonism was also important for some romantic thinkers, including Schelling, for whom the work of Giordano Bruno in particular provided a means of overcoming the influence of Fichte. His most explicit engagements with neo-platonism are his works *On the World Soul* (1798), which Goethe greatly admired, and

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to Cunningham and Jardine, 1f.

*Bruno* (1802). Schelling's shift from a Fichtean to a neo-platonic framework can nonetheless also be traced in the revised edition of his *Ideas for a Philosophy of Nature* of 1803.<sup>6</sup> Goethe, again like Schelling, was also truly romantic in his fascination with those natural phenomena with regard to which the mechanistic view of matter seemed inadequate, such as galvanism and magnetism, which he studied as a Law student in Leipzig between 1765 and 1768, as well as chemistry and, above all, biology.

One of the most important ingredients in the romantic reanimation of nature was the theory of dynamic polarity, derived from the observation of electrical charges, magnetic attraction and chemical reactions, and first formulated philosophically by Kant in an important essay of 1786 on the 'Metaphysical Foundations of Natural Science'. Here Kant argued that rather than consisting of inert atoms moved purely by external, mechanical force à la Newton, matter should rather be seen in terms of a dynamic interplay of inherent forces of attraction and repulsion (1970, 40-54). The principle of polarity is central both to Schelling's *Naturphilosophie* and Goethean science, where it is rendered even more dynamic in being coupled with the principle of 'augmentation' or 'intensification' (*Steigerung*), according to which polarities are seen to restabilize at higher levels or in new formations.<sup>7</sup> The second key element in romantic science and

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<sup>5</sup> Goethe and Schelling remained in correspondence even after the latter moved to Munich in 1805, retaining a lively interest in one another's work right up until Goethe's death in 1832. See Schüddekopf and Walzel 204-75.

<sup>6</sup> Schelling's objections to Fichte's purely instrumental view of the natural world are elaborated in his essay "On the True Concept of Naturphilosophie and the Correct Way to Solve its Problems" (1801). See Bowie, 57-9.

<sup>7</sup> In his commentary of 1828 on the essay "Nature" by J. G. C. Tobler, Goethe refers to polarity and intensification as "the two great driving forces in all nature", and goes on to explain: "Polarity is a state of constant attraction and repulsion, while intensification is a state of ever-striving ascent." In Goethe's view, polarity pertains to matter and intensification to spirit, however since "matter can never exist and act without spirit, nor

*Naturphilosophie* is the recognition of the self-regenerative, self-transformative and indeed self-organizing capacities of biological organisms, their ‘formative drive’ (*Bildungstrieb*) as Blumenbach put it in his influential account of this phenomenon of 1789.<sup>8</sup> This epigenetic understanding of the organism was moreover projected onto the natural world as a whole, which thereby became reconfigured as a dynamic unity-in-diversity, rather than as a mechanical assemblage – a sort of meta-organism which, as suggested by new findings in geology and paleontology, was not a static ‘creation’, but involved rather in an ongoing process of self-becoming.<sup>9</sup> Metamorphosis, to adopt one of Goethe’s favorite terms, was manifest not only in the life cycle of the individual organism, but also in the emergence and transformation of species, the historicity of the earth and in the wider process of cosmological unfolding.<sup>10</sup>

This emphasis on the underlying unity of nature was also expressed in the growing recognition of the profound interrelatedness of all entities and processes in the natural world. Thus, as Goethe wrote in his essay on experimental method of 1792:

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spirit without matter, matter is also capable of undergoing intensification, and spirit cannot be denied its attraction and repulsion.” (Goethe 1988, 6). On polarity in romantic science, see e.g. the articles by Snelders, Levere, and Wetzels.

<sup>8</sup> Both Goethe and Schelling reinterpreted Blumenbach’s *Bildungstrieb* along non-vitalist lines: Schelling, in terms of a “free-play of forces which is continually sustained by some external influence” (cit. Bowie, 37); and Goethe, in terms of the concept of metamorphosis. See e.g. his note on the formative impulse in Goethe 1988, 35f., and Kuhn.

<sup>9</sup> Kant also refers to nature as a unity-in-multiplicity, *Einheit der Mannigfaltigen*, in his *Critique of Judgement*, while cautioning that this is a unity posited by human reason, rather than one that can be demonstrated empirically as pertaining to the natural world *an sich* (1892, 19-26 and 259-61). On the reception of Kant’s theory of organic unity within romantic science, see e.g. Gregory and Lenoir.

<sup>10</sup> On the importance of geology and paleontology to the new understanding of the historicity of the earth, see also Rupke. As Levere observes, the cosmology of Kant and Laplace contributed significantly to the romantic understanding that the universe itself was evolving (300f.).

All things in nature [...] work incessantly upon one another; we can say that each phenomenon is connected with countless others just as we can say that a point of light floating in space sends its rays in all directions.  
(Goethe 1988, 16)

In the life sciences, this concern with interconnectedness led to a move away from Linnean taxonomy towards the examination of the interdependence of organisms with each other and with their inorganic environment.<sup>11</sup> Goethe reflects upon this shift in his own botanical studies, recalling how during his trip to Italy in the 1780s he became increasingly aware of connections between species variation and distribution and such factors as soil, climate and topography.<sup>12</sup> The recognition of the interrelatedness and interactivity of all elements in what would now be termed a bioregional ecosystem was especially well understood in romantic geography, above all in the work of Alexander von Humboldt, whose account of his researches in South America was dedicated to Goethe, his close friend and sometime collaborator.<sup>13</sup>

It is of course this appreciation of interconnectedness which most clearly qualifies romantic science and *Naturphilosophie* as a form of ecology *avant la lettre*. However, from an ecophilosophical perspective, the dynamistic and organismic dimensions of the

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<sup>11</sup> On interrelatedness and interactivity as a key concept in romantic science, see Müller.

<sup>12</sup> Goethe, “Der Verfasser teilt die Geschichte seiner botanischen Studien mit” (1817), in Goethe 1966, 160-3.

<sup>13</sup> Alexander von Humboldt, *Ideen zu einer Geographie der Pflanzen*, 1805-6. See Nicholson.

romantic discourse on nature are equally significant. For, in returning to nature those properties of mind or spirit, creativity and freedom which, for rationalists such as Descartes and Kant were the exclusive preserve of man, romantic science and philosophy were profoundly subversive of those dualistic structures of Western thought which sundered mind from matter, soul from body, and reason from nature, while privileging the first of these terms as the sole locus of agency and value. The counterpart of this reanimation of nature was the renaturalisation of humanity. As embodied creatures, human beings, no less than plants and animals, could now be seen to exist in a condition of profound interdependence with other species and their shared environment. Thus, for example, in his 'Reflections on the Philosophy of History of Mankind' (1784-6), Goethe's friend and mentor Herder seeks to explain human physical and cultural variation as at least in part a matter of adaptation or 'acclimatization' to environmental contingencies such as topography, climate and the kinds of plants and animals available for food and clothing. (Herder 3-78)<sup>14</sup> Moreover, as indicated by Goethe's comments on the intermaxillary bone, humans were themselves also seen to be closely related to other species morphologically. Herder's explanation for this, which Goethe adopted and adapted, posited an original prototype which reappears in a potentially limitless series of variations. Although Goethe shied away from interpreting this in terms of actual evolutionary descent – Goethe's 'primal plant' (*Urpflanze*) is more like an ideal type than a common ancestor – this line of thinking nonetheless countered traditional assumptions of human apartness in affirming those continuities which link us to our

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<sup>14</sup> On Goethe's naturalistic anthropology and its relation to 18<sup>th</sup> century thought, above all Herder's, see Bell.

furry, feathered, scaly and even leafy kin.<sup>15</sup> Even those capacities which seemed most to separate us from our non-human relations in the plant and animal kingdoms, our consciousness, reason or moral autonomy, could now be recognised as indebted to organic nature, just as the organic was indebted to the inorganic. The most significant philosophical formulation of this insight was Schelling's, who affirmed – contra the Idealism of Fichte and Hegel, no less than the rationalism of Descartes – „it is not because there is thinking that there is a being, but because there is a being that there is a thinking.“ (cit. Bowie 167) Mind or spirit (*Geist*), according to Schelling, was at once inherent in nature<sup>16</sup> and an 'emergent' property of the human: that is to say, in humanity, mind/spirit emerges into consciousness. It does so, however, at the price of a forgetfulness of its source in nature. The task of philosophy for Schelling thus consisted principally in the „recollection of that condition in which we were at one with nature“.<sup>17</sup>

For Goethe, this remembering of our embeddedness in nature was to be achieved not, as with Schelling, through abstract philosophical speculation, but rather through the close observation of particular natural phenomena, in which the underlying creative processes of 'nature naturing', *natura naturans*, were disclosed. Indeed, this very act of

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<sup>15</sup> In this respect, Goethe's contemporary in England, Erasmus Darwin, grandfather of Charles, was more daring. In *Zoonomia* (1794), e.g. he speculated that "it is not impossible but the great variety of species of animals, which now tenant the earth, may have had their origin from the mixture of a few natural orders." Cit. Nichols 3 of 9. That Goethe was nonetheless entertaining such possibilities in private around 1784 is indicated by a letter which his close friend and confidante Charlotte von Stein wrote to Knebel in May of that year. Herder's latest writings – presumably the first part of the "Reflections", which came out in 1784 – she tells Knebel, "makes it probable that we were first plants and animals; what nature will make of us will remain unknown to us: Goethe expends much profound thought on these things." Cit. Kuhn 12.

<sup>16</sup> On the unity of mind and nature in romantic science and philosophy see also Morgan, and Heidelberger.

observation was in Goethe's view a mode of remembering our corporeal embeddedness in nature, to the extent that it relied, in the first place at least, upon the activation, and cultivation, of our senses. Goethe realised, moreover, that any science which sought to uncover the creativity of living nature, along with its patterns of interrelatedness and ultimate unity-in-diversity, would have to be a different kind of science from that of Newtonian mechanics. Today, it is above all the alternative methodology which Goethe developed on this premise that is seen as his most significant contribution to a new phenomenology of nature, with applications in botany, zoology, hydrology and quantum optics, as well as landscape design, architecture and even town planning.<sup>18</sup>

Infamously, Francis Bacon had recommended the pursuit of knowledge via attention to *natura torturata*, 'tortured nature', on the assumption that nature 'betrays her secrets more fully when in the grip and under the pressure of art' (99). Goethe, like many Romantics, was a great admirer of Bacon, but he took a somewhat different view of this matter, asserting in one of his 'Maxims and Reflections' that „Nature will reveal nothing under torture“ (Goethe 1988, 307). In order to allow natural entities to 'speak', to disclose themselves as dynamic and interconnected, it was necessary to develop a more gentle or „delicate“ (*zart*) empiricism (307). Whereas mechanistic science presupposes a strict subject-object dualism, Goethean science is emphatically participatory: 'delicate empiricism' involves a respectful opening to the other, an attentive absorption in the

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<sup>17</sup> "Allgemeine Deduktion des dynamischen Prozesses oder der Kategorien der Physik" (1800), cit. Marquard 159 (my trans.).

<sup>18</sup> On Goethean approaches in contemporary botany, see e.g. Bockemühl and Hoffmann; in zoology, see there too Riegner (1998) Holdrege; in hydrology, see Riegner and Wilkes; in quantum optics, see Zajonc; in the 'reading' and designing of landscape, see Riegner (1993) and Brook 1998; in architecture, see Coates; finally, on the development

phenomenon as it reveals itself to the observer through their sensuous co-presence, to the point where the thing observed elicits in the observer those new, mental ‘organs of perception’ by means of which its inner principle of unity might be apprehended.<sup>19</sup> Newton’s theory of the refrangibility of light was an inadequate explanation for the phenomenon of colour for Goethe because it disconnected it from the everyday contexts in which it was encountered and effaced the involvement of the observer in its appearance, substituting for sensuous experience a series of mathematical formulae. On the other hand, Newton’s method was also inadequately ‘objective’ (*gegenständlich*) in Goethe’s view, in that his ‘proof’ was engendered by a single experiment designed to validate a pre-formed theory.<sup>20</sup>

To some extent, as Goethe realized, all experimentation was, in Schelling’s words, a “production of the phenomena”.<sup>21</sup> Goethe nonetheless believed that a fuller understanding of phenomena might be gained by viewing them in their interrelatedness with other phenomena and from as many different angles as possible, as in the series of experiments which he set up in his own color investigations. Ultimately, however, it was essential that the scientist retain what Goethe terms in the Preface to the *Farbenlehre* a

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of ‘ecological aesthetics’, based partly on Goethean science, in interior design and town planning, as well as in art and literature, see Böhme 1989.

<sup>19</sup> “The human being knows himself only insofar as he knows the world; he perceives the world only in himself, and himself only in the world. Every new object, clearly seen, opens up a new organ of perception in us.” Goethe 1988, 39.

<sup>20</sup> Goethe’s objections to Newton’s theory are developed at length in the second “Polemical” part of the *Farbentheorie*. However, the crux of his objection to Newton’s method is also explained far more succinctly in Goethe’s fascinating essay on “The Experiment as Mediator between Object and Subject” of 1792. See Goethe 1988, 11-17. See also Sepper.

<sup>21</sup> “Every experiment is a question addressed to nature that nature is forced to answer. But every question contains a hidden a priori judgement; every experiment which is an

certain `ironic` awareness that his findings would never be complete, or completely free of `theory`:

Every act of looking turns into observation, every act of observation into reflection, every act of reflection into the making of associations; thus it is evident that we theorize every time we look carefully at the world. The ability to do this with clarity of mind, with self-knowledge, in a free way, and (if I might venture to put it so) with irony, is a skill we will need in order to avoid the pitfalls of abstraction and attain the results we desire, results which can find a living and practical application. (Goethe 1988, 159)

The concomitant of this hermeneutic moment within Goethe's philosophy of science is the recognition of the profound historicity – and hence provisionality – of all scientific knowledge: indeed, as Goethe puts it here, “it is also possible to say that the history of science is science itself” (161). It is in keeping with this strikingly modern understanding of the hermeneutics of science that Goethe concludes his *Farbenlehre* with a long and detailed account of its pre-history in the research and reflection of others.<sup>22</sup>

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experiment is a prophecy; experimentation in itself is a production of the phenomena.”  
Cit. Bowie 39.

<sup>22</sup> On the importance of Goethe's contribution to the history of science, see Fink.

Goethean science, then, is addressed to the becoming both of natural phenomena and of our own understanding thereof: to the formation (*Bildung*) and transformation (*Umbildung*) of things and to the way in which we ourselves are formed or 'educated' (*gebildet*) through our close encounter with the phenomena of our investigations. For the aim of Goethean science, in the first place at least, is not the domination of nature, but, as Frederick Amrine rightly observes, "the metamorphosis of the scientist."<sup>(42)</sup> This does not mean, however, that Goethean science is 'pure', rather than 'applied'. Far from it. His early botanical studies, for example, were undertaken in association with his practical work in garden design at the Weimar court, and the *Farbenlehre* contains a section on the use of color in the craft of dyeing. Similarly, the reflective dimension of Goethe's nature poetry needs to be read in relation to his simultaneous commitment to the appropriation and utilization of nature's bounty. Goethe's celebration of the well-being to be found in the quietude of the forest on a still night, subsequently published under the title 'Wandrer's Nachtlied' ('Traveller's Nightsong')<sup>23</sup> – possibly the most famous German poem ever written - was originally inscribed on the wall of a wooden hunting-hut during Goethe's visit to Ilmenau in 1780, the purpose of which was to explore the possibility of reopening the Ducal silver mines – a project that Goethe pursued with great enthusiasm, and modest success, for several years.<sup>24</sup> Among his other areas of responsibility at this time were several that would now be termed resource management and infrastructure development: forestry and hunting, and the building and improvement of roads, promenades and city pavements. Moreover, Goethe's undying optimism regarding the

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<sup>23</sup> "Over the hilltops all/Is still/Hardly a breath/Seems to ruffle/Any tree crest;/In the wood not one small bird's song./Only wait, before long/ You too will rest." Trans. Michael Hamburger.

technological application of scientific knowledge is evident in his excitement about the advent of the steam-train and his interest in the possibility of large-scale engineering schemes, such as the building of the Panama and Suez canals.<sup>25</sup>

Although such enthusiasm for the humanization of nature might seem to contradict the ethos of respect for the self-unfolding of the other underlying Goethe's 'delicate empiricism', it is possible to see a certain dialectical logic at work here. Goethe's reasoning, I think, runs something like this: If the human mind/body was itself a product of nature – and it is this which grounds our capacity to sensuously perceive and consciously understand non-human nature, if only ever incompletely – then our capacity and propensity to reshape the natural world through those understandings and technologies made possible by our human minds/bodies was itself ultimately 'natural', as was the outcome of that reshaping. In reasoning thus, Goethe was clearly more consistent than those Deep Ecologists who insist that we are 'a part of nature' and that 'nature knows best', but that our technological civilization is somehow 'unnatural'.<sup>26</sup> Goethe's enthusiasm for the technological refashioning of the natural world nonetheless rests upon certain other assumptions too, in which, from a contemporary perspective, there is as much blindness as insight. Consider, for example, his essay on meteorology of 1825, in which we find the following general observation on the place of humanity in the natural world:

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<sup>24</sup> See Conrady 405ff; and Boyle 349.

<sup>25</sup> In a conversation with Eckermann of 21 February 1827, for example, Goethe declared that he would like to live another fifty years in order to witness such projects as the building of the Panama and Suez canals and the linking of the Rhine and Danube rivers. Eckermann, 466f.

<sup>26</sup> This logical contradiction within some philosophical articulations of Deep Ecology during the 1980s and early 1990s is explored by Freya Mathews (1994).

Where man has taken possession of the earth and is obliged  
to keep it, he must be forever vigilant and ready to resist.  
(Goethe 1988, 147)

Here it becomes apparent that Goethe is, after all, the inheritor of a tradition from which he never entirely freed himself, whereby the appropriation and domination of the earth by 'man' was in some sense preordained.<sup>27</sup> For it is presumably this assumption, deriving historically from the enculturation of a particular reading of Genesis 1:28, which underlies his assertion that it is our 'duty' (*Pflicht*) to maintain our sway over those lands in our rightful 'possession'.<sup>28</sup> In Goethe's exhortation to 'vigilance' and 'resistance' there is also an echo of the myth of the Fall from Genesis 3, according to which the natural world is said to have been transformed from bountiful habitus to recalcitrant adversary, causing Eve's daughters to give birth in agony, while Adam's sons are forced to labor hard for their living in a world harboring dangerous beasts and barren lands.<sup>29</sup> This adversarial construction of the relationship between humanity and nature is reinforced in the following passage from Goethe's essay:

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<sup>27</sup> This is also the conclusion arrived at by Peter Marshall, who observes in *Nature's Web* that "despite his organic approach in science, Goethe remained to the end the prisoner of the dream of transforming nature which has bedevilled Western civilization" (287).

<sup>28</sup> On the role of this reading of Genesis 1:28 in legitimating attitudes and practices oriented towards the domination of nature, see White.

<sup>29</sup> On the role of the myth of the Fall and the promise of Paradise Regained in legitimating the Western project of the humanization of nature, see Merchant 1995.

[...] Thus the elements are to be viewed as colossal opponents with whom we must forever do battle; in each case we can overcome them only through the highest powers of the mind, by courage and cunning (147)

Goethe then proceeds to instance the potential violence of the elements, before concluding, in true Baconian style:

These observations depress us when we realize how often we must make them after a great and irretrievable catastrophe. It elevates our hearts and minds, however, when we realize how man has armed himself against the elements, defended himself, and even used the enemy as his slave. (147)

The manfully militaristic rhetoric of this essay is certainly a far cry from the contemporary ecofeminist insistence on the need for a new ethic of 'partnership' (Merchant) or 'mutuality' (Plumwood) to govern our relations with the natural world.<sup>30</sup> Admittedly, it is perhaps easier to think in these terms when you are no longer so exposed to the vagaries of an often-harsh climate as were Goethe and his contemporaries in Northern Europe in the early 1800s. In fact, Goethe wrote his essay on meteorology in the wake of precisely that kind of 'natural disaster' to which he alludes in the passage

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<sup>30</sup> See Merchant 1995, 209ff. ; and Plumwood, 1993, 156ff.

cited above: namely, the catastrophic tidal floods that struck the North Sea coast in February 1825, “devastating hundreds of square miles of land and killing 800 people.” (Luke 1994, liv)<sup>31</sup> As David Luke observes in the Introduction to his translation of *Faust. Part Two*, this event also appears to have provided a significant environmental context for the composition of this work, to which Goethe returned at precisely this time (liv).

Considered in relation to these tidal floods and intertextually with the essay on meteorology, *Faust. Part Two* dramatizes a certain dialectic of the sea, which might be read as metonymic for the relationship between humanity and the natural world as a whole. One side of this dialectic is represented at the end of Act II, in which the Homunculus, Wagner’s flawed test-tube baby, finally returns to the sea in order to become fully incarnated as human through the long process of morphogenetic evolution – in Thales’ words, to “Move onward by eternal norms/Through many thousand thousand forms/And reach at last the human state” (II, 8324-6). Here, at the close of the ‘classical Walpurgis night’, the ocean is celebrated as the precondition for the emergence of all life, and, through its role in cloud formation, for the continuation of all life. As Thales affirms, “In water all things begin to thrive!! By water all things are kept alive!” (II, 8435-6).<sup>32</sup> On the other hand, the salty waters of the sea can also prove a threat to many terrestrial life forms, including our own. This is the other side of the dialectic: We cannot grow food or build towns on the shifting salty sands of its shore, and if we do make our homes too

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<sup>32</sup> The sea is also assumed to be the source of all earth life in Erasmus Darwin’s *Temple of Nature* (1803), in which we read, “Organic life beneath the shoreless waves/ Was born and nurs’d in Ocean’s pearly caves;/ First forms minute, unseen by spheric glass,/ Move in the mud, or pierce the watery mass;/ These, as successive generations bloom,/ New powers acquire, and larger limbs assume;/ Whence countless groups of vegetation spring,/ And breathing realms of fin, and feet, and wing” (I:295). Cit. Nicols 3 of 9.

close to the waves, they might one day engulf and drown us. The Promethean construction scheme that Faust embarks upon in the last two Acts of the play nonetheless goes way beyond the dictates of self-preservation. Rather than simply keeping a prudent distance from the ocean, Faust determines to assert himself over it: “My soul shall boast/An exquisite achievement: From our coast/I’ll ban the lordly sea, I’ll curb its force,/I’ll set new limits to that watery plain/And drive it back into itself again.” (IV, 10227-31). Driven by this desire for mastery, Faust, as we discover in the final Act, has not only walled off the sea with dykes, but also had dug, at high speed and great cost to his laborers,<sup>33</sup> a system of canals to irrigate the coastal plains. This kind of forced canalization was referred to in the scientific literature consulted by Goethe as ‘hydrological terrorism’: it frequently resulted in disaster when the still-standing water was colonized by water-plants, gradually turning the canal into a swamp.<sup>34</sup> In Dieter Borchmeyer’s interpretation, this is indeed what has happened to Faust’s canals, for in his final speech Faust exclaims: “A swamp surrounds the mountains’ base;/It poisons all I have achieved till now.” (V, 11559)<sup>35</sup> Alternatively, what Faust here calls a ‘putrid puddle’ (*faulen Pfuhl*, 11560) might be identified as what today’s ecologists would see as a precious wetland, often the first target of the colonizing developer’s destructive zeal. However that might be, it is this swamp that Faust, who is by this stage old and blind, now dreams of draining. In doing so, he hopes to create conditions suitable for the emergence of a new society of free men - men whose freedom is earned, moreover, in

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<sup>33</sup> “All night long we heard the cries – A canal was built by morning”, recalls Baucis (V, 11129f)

<sup>34</sup> See Segeberg.

their daily ongoing struggle against the encroaching waters of swamp and sea. And it is in the moment of contemplating this future fulfillment of his Promethean ambitions that he dies – and, infamously, is redeemed.

At this point, it is important to distinguish Faust's blindness from Goethe's. Despite the unconventional ending he has given his version of the Faust-legend, Goethe follows Marlowe in designating his play a 'tragedy'. Goethe does not deny the appalling cost of the Faustian 'drama of development', as Marshall Berman aptly calls it,<sup>36</sup> embodied above all in the death of the prior inhabitants of the shore, Philemon and Baucis, whose modest abode, ancient chapel and linden grove stand in the way of Faust's planned modernization of their region – paid for, it might be added by pirate raids on trading vessels, shipping home the fruits of empire. In a sense, Goethe's insight in *Faust* might be measured by Faust's blindness – that is, if the literal blindness with which he is cursed by Care in Scene 20, is read as a concretization of the metaphoric blindness with which he has pursued his Promethean quest hitherto. Moreover, to the extent that Faust had sought not only completely to remake the world, or at least this part of it, in his own image, but also to win a final victory over the sea, his quest was itself blind. For, as Goethe observes in the essay on meteorology, in our struggle with the elements, no final victory is possible; at most, we can expect to win the occasional battle, for the forces of nature will ultimately always be greater than us. In *Faust* this insight is voiced by Mephistopheles, who observes in a sardonic aside, "Do what you will, my friend,/You all are doomed! They are in league with me,/The elements, and shall destroy you in the end."

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<sup>35</sup> The suggestion that it is the canals themselves that have become poisoned is perhaps stronger in the original: "Ein Sumpf zieht am Gebirge hin;/Verpestet alles schon Errungene". See Borchmeyer, 564f.

(V, 11548-50) In this sense Goethe recognizes that the earth is not, and cannot be, wholly 'man's possession', for it can never be wholly under our sway. Even were such ultimate mastery possible, it would not, from Goethe's perspective, be desirable. For just as a plant takes shape and grows through encountering limits and entering into relations with a network of others, so too human beings need to encounter the multiple otherness of an encompassing natural world in order to realize our full potential. Faust seems to acknowledge this principle before he dies in proclaiming, "Only that man earns freedom, merits life,/Who must reconquer both in daily strife./In such a place, by danger still surrounded,/Youth, manhood, age, their brave new world have founded." (V, 11575-8).

And yet, from a contemporary perspective, it is in a sense precisely Goethe's confidence in the ultimate invincibility of the elements which blinds him to the potential danger of the high-tech humanization of the natural world. Certainly, it is true on one level that nature retains a certain unpredictable otherness – we will, for example, never be able to get the weather report absolutely right all the time; we can do little more than take protective measures, if that, in the face of earthquakes, volcanoes and tornadoes; in some of the more exciting parts of the world, as Val Plumwood reminds us<sup>37</sup>, we are, moreover, still liable to be preyed upon by carnivores higher up the food chain, - and there is, as yet, nothing that we can do about death, apart from delay its inevitability. On another level, however, there is no longer any place on earth that has not been touched in some way by the consequences of human technology, and our wider biotic community is becoming increasingly impoverished as our own numbers continue to swell. In that sense,

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<sup>37</sup> Plumwood was severely injured and narrowly escaped being eaten by a large salt water crocodile in Kakadu National Park. She has since written very interestingly about how

the whole earth is, as Bill McKibben puts it, more or less anthropogenic. Outside the artificial environment of the shopping mall or luxury hotel, however, the humanization of the earth resembles not so much the recreation of the Garden as the degradation of creation. In the era of global warming, moreover, the dialectic of the sea has taken a new turn. For, in the not too distant future, the inundation of many areas of human habitation will be the result, not of a natural, but of an unnatural disaster – nature’s unanticipated answer to our endeavors to enhance human power, wealth and comfort, at least for the privileged minority, with little understanding or concern about the consequences for others, human and otherwise, or for the biosphere as a whole.

Knowing, as Goethe could not, the relative fragility of that particular unstable and impermanent constellation of factors which has favored the emergence and flourishing of such a rich diversity of life forms on earth; and knowing also, as undoubtedly Goethe did, the inevitable limits of our knowledge, we now need to oppose and resist, not so much the elements, but rather that Promethean impulse to remake the world in our own image which Goethe symbolized so presciently in the figure of Faust. What is required now is not only a ‘gentle empiricism’, but also a ‘gentle technology’. Moreover, considering that while the human capacity for ethical choice may arise *from* nature, our actual choices are not in any sense predetermined *by* nature, we would do well to question as culturally contingent the Western perception of nature as an adversary to be conquered, in favor perhaps of a more modest self-understanding as a “plain member and citizen of the land community” (Leopold). From this perspective ‘freeing the phenomena’ would be an issue not only for the theory and practice of science: it would also signify an ethical imperative,

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the experience of being prey challenges modern assumptions about what it means to be

the actualization of which would radically transform our vexed relations with our earth  
others in all their manifold, yet sadly diminishing, multiplicity.

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