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ROUTLEDGE LITERATURE READERS

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Ecocriticism

The Essential Reader

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RLR

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2015
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Ecocriticism : the essential reader / edited by Ken Hiltner.
pages cm
Includes bibliographical references and index.
1. Ecocriticism. 2. Ecology in literature. 3. Environmental protection in literature. I. Hiltner, Ken, editor of compilation.
PN98.E36E39 2014
809′.9336—dc23

2013050181

ISBN: 978-0-415-50859-9 (hbk)
ISBN: 978-0-415-50860-5 (pbk)

Typeset in Perpetua
by RefineCatch Limited, Bungay, Suffolk

Printed and bound in the United States of America by
Edwards Brothers Malloy on sustainably sourced paper.

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Chapter 2

Carolyn Merchant

NATURE AS FEMALE

THE WORLD WE HAVE lost was organic. From the obscure origins of our species, human beings have lived in daily, immediate, organic relation with the natural order for their sustenance. In 1500, the daily interaction with nature was still structured for most Europeans, as it was for other peoples, by close-knit, cooperative, organic communities.

Thus it is not surprising that for sixteenth-century Europeans the root metaphor binding together the self, society, and the cosmos was that of an organism. As a projection of the way people experienced daily life, organismic theory emphasized interdependence among the parts of the human body, subordination of individual to communal purposes in family, community, and state, and vital life permeating the cosmos to the lowliest stone.

The idea of nature as a living organism had philosophical antecedents in ancient systems of thought, variations of which formed the prevailing ideological framework of the sixteenth century. The organismic metaphor, however, was immensely flexible and adaptable to varying contexts, depending on which of its presuppositions was emphasized. A spectrum of philosophical and political possibilities existed, all of which could be subsumed under the general rubric of *organic*.

NATURE AS NURTURE: CONTROLLING IMAGERY. Central to the organic theory was the identification of nature, especially the earth, with a nurturing mother: a kindly beneficent female who provided for the needs of mankind in an ordered, planned universe. But another opposing image of nature as female was also prevalent: wild and uncontrollable nature that could render violence, storms, droughts, and general chaos. Both were identified with the female sex and were projections of human perceptions onto the external world. The metaphor of the earth as a nurturing mother was gradually to vanish as a dominant image as the Scientific Revolution proceeded to mechanize and to rationalize the world view. The second image, nature as disorder, called forth an important modern idea, that of power over nature. Two new ideas, those of mechanism and of the domination and mastery of nature, became core concepts of the modern world. An organically oriented mentality in which female principles played an important role was undermined and replaced by a mechanically oriented mentality that either eliminated or used female principles in an exploitative manner. As

Western culture became increasingly mechanized in the 1600s, the female earth and virgin earth spirit were subdued by the machine.[1]

The change in controlling imagery was directly related to changes in human attitudes and behavior toward the earth. Whereas the nurturing earth image can be viewed as a cultural constraint restricting the types of socially and morally sanctioned human actions allowable with respect to the earth, the new images of mastery and domination functioned as cultural sanctions for the denudation of nature. Society needed these new images as it continued the processes of commercialism and industrialization, which depended on activities directly altering the earth—mining, drainage, deforestation, and assarting (grubbing up stumps to clear fields). The new activities utilized new technologies—lift and force pumps, cranes, windmills, geared wheels, flap valves, chains, pistons, treadmills, under- and overshot watermills, fulling mills, flywheels, bellows, excavators, bucket chains, rollers, geared and wheeled bridges, cranks, elaborate block and tackle systems, worm, spur, crown, and lantern gears, cams and eccentrics, ratchets, wrenches, presses, and screws in magnificent variation and combination.

These technological and commercial changes did not take place quickly; they developed gradually over the ancient and medieval eras, as did the accompanying environmental deterioration. Slowly over many centuries early Mediterranean and Greek civilization had mined and quarried the mountainsides, altered the forested landscape, and overgrazed the hills. Nevertheless, technologies were low level, people considered themselves parts of a finite cosmos, and animism and fertility cults that treated nature as sacred were numerous. Roman civilization was more pragmatic, secular, and commercial and its environmental impact more intense. Yet Roman writers such as Ovid, Seneca, Pliny, and the Stoic philosophers openly deplored mining as an abuse of their mother, the earth. With the disintegration of feudalism and the expansion of Europeans into new worlds and markets, commercial society began to have an accelerated impact on the natural environment. By the sixteenth and seventeenth centuries, the tension between technological development in the world of action and the controlling organic images in the world of the mind had become too great. The old structures were incompatible with the new activities.

Both the nurturing and domination metaphors had existed in philosophy, religion, and literature. The idea of dominion over the earth existed in Greek philosophy and Christian religion; that of the nurturing earth, in Greek and other pagan philosophies. But, as the economy became modernized and the Scientific Revolution proceeded, the dominion metaphor spread beyond the religious sphere and assumed ascendancy in the social and political spheres as well. These two competing images and their normative associations can be found in sixteenth-century literature, art, philosophy, and science.

The image of the earth as a living organism and nurturing mother had served as a cultural constraint restricting the actions of human beings. One does not readily slay a mother, dig into her entrails for gold or mutilate her body, although commercial mining would soon require that. As long as the earth was considered to be alive and sensitive, it could be considered a breach of human ethical behavior to carry out destructive acts against it. For most traditional cultures, minerals and metals ripened in the uterus of the Earth Mother, mines were compared to her vagina, and metallurgy was the human hastening of the birth of the living metal in the artificial womb of the furnace—an abortion of the metal's natural growth cycle before its time. Miners offered propitiation to the deities of the soil and subterranean world, performed ceremonial sacrifices, and observed strict cleanliness, sexual abstinence, and fasting before violating the sacredness of the living earth by sinking a mine. Smiths assumed an awesome responsibility in precipitating the metal's birth through smelting, fusing, and beating it with hammer and anvil; they were often accorded the status of shaman in tribal rituals and their tools were thought to hold special powers.

The Renaissance image of the nurturing earth still carried with it subtle ethical controls and restraints. Such imagery found in a culture's literature can play a normative role within the culture. Controlling images operate as ethical restraints or as ethical sanctions—as subtle "oughts" or "ought-nots." Thus as the descriptive metaphors and images of nature change, a behavioral restraint can be changed into a sanction. Such a change in the image and description of nature was occurring during the course of the Scientific Revolution.

It is important to recognize the normative import of descriptive statements about nature. Contemporary philosophers of language have critically reassessed the earlier positivist distinction between the "is" of science and the "ought" of society, arguing that descriptions and norms are not opposed to one another by linguistic separation into separate "is" and "ought" statements, but are contained within each other. Descriptive statements about the world can presuppose the normative; they are then ethic-laden. A statement's normative function lies in the use itself as description. The norms may be tacit assumptions hidden within the descriptions in such a way as to act as invisible restraints or moral ought-nots. The writer or culture may not be conscious of the ethical import yet may act in accordance with its dictates. The hidden norms may become conscious or explicit when an alternative or contradiction presents itself. Because language contains a culture within itself, when language changes, a culture is also changing in important ways. By examining changes in descriptions of nature, we can then perceive something of the changes in cultural values. To be aware of the interconnectedness of descriptive and normative statements is to be able to evaluate changes in the latter by observing changes in the former.[2]

Not only did the image of nature as a nurturing mother contain ethical implications but the organic framework itself, as a conceptual system, also carried with it an associated value system. Contemporary philosophers have argued that a given normative theory is linked with certain conceptual frameworks and not with others. The framework contains within itself certain dimensions of structural and normative variation, while denying others belonging to an alternative or rival framework.

We cannot accept a framework of explanation and yet reject its associated value judgments, because the connections to the values associated with the structure are not fortuitous. New commercial and technological innovations, however, can upset and undermine an established conceptual structure. New human and social needs can threaten associated normative constraints, thereby demanding new ones.

While the organic framework was for many centuries sufficiently integrative to override commercial development and technological innovation, the acceleration of such changes throughout western Europe during the sixteenth and seventeenth centuries began to undermine the organic unity of the cosmos and society. Because the needs and purposes of society as a whole were changing with the commercial revolution, the values associated with the organic view of nature were no longer applicable; hence the plausibility of the conceptual framework itself was slowly, but continuously, being threatened.

In order to make this interpretation of cultural change convincing, it will be advantageous to examine the variations of the organic framework, focusing on its associated female imagery and pointing out the values linked to each of the variants. It will then be possible to show how, in the context of commercial and technological change, the elements of the organic framework—its assumptions and values about nature—could be either absorbed into the emerging mechanical framework or rejected as irrelevant.

The Renaissance view of nature and society was based on the organic analogy between the human body, or microcosm, and the larger world, or macrocosm. Within this larger framework, however, a number of variants on the organic theme were possible. The primary view of nature was the idea that a designed hierarchical order existed in the cosmos and society corresponding to the organic integration of the parts of the body—a projection of the

human being onto the cosmos. The term nature comprehended both the innate character and disposition of people and animals and the inherent creative power operating within material objects and phenomena. A second image was based on nature as an active unity of opposites in a dialectical tension. A third was the Arcadian image of nature as benevolent, peaceful, and rustic, deriving from Arcadia, the pastoral interior of the Greek Peloponnesus. Each of these interpretations had different social implications: the first image could be used as a justification for maintaining the existing social order, the second for changing society toward a new ideal, the third for escaping from the emerging problems of urban life. Drawing on the work of literary critics and historians of science and art, we can construct a spectrum of images of nature and delineate their associated value systems.

LITERARY IMAGES. The Chaucerian and typically Elizabethan view of nature was that of a kindly and caring motherly provider, a manifestation of the God who had imprinted a designed, planned order on the world.[3] This order imposed ethical norms of behavior on the human being, the central feature of which was behavioral self-restraint in conformity with the pattern of the natural order. Each organic creature was responsible for maintaining its own place and expressing itself within the natural order and was a necessary part of the whole, but was not the whole itself. The Elizabethan first had to understand his or her own place dictated by the cosmic and social order and then to act in accordance with the traditional reason and restraint that would maintain the balance and harmony of the whole. This reverence for nature's law was expressed by Richard Hooker (1593): "See we not plainly that obedience of creatures unto the law of nature is the stay of the whole world." Nature operated "without capacity or knowledge," solely on the basis of "her dexterity and skill," as the instrument of God's expression in the mundane world. Whatever was known of God was taught by nature, "God being the author of Nature, her voice is but his instrument. By her from him we receive whatsoever in sort we learn."[4] Here nature is God's involuntary agent, a benevolent teacher of the hidden pattern and values God employed in creating the visible cosmos (*natura naturata,* the natural creation). A somewhat less orthodox view saw her as a creative force *(natura naturans)*—a soul with a will to generate mundane forms.

In Shakespeare's tragedy *King Lear,* the king, as human nature, represented Renaissance man, whose worldly existence was part of a larger patterned whole and of the contemporary hierarchical social order. His human nature symbolized the medieval-Renaissance cosmos whose patterns must not be violated. Lear's nature was a composite structure of the qualities of benevolence, comfort, and generosity, dictating honor and charity in his own ethical behavior as father of the household and reverence for his authority and wisdom on the part of his daughters.

Lear's daughter Cordelia represented utopian nature, or nature as the ideal unity of the opposites, a second image of nature within the larger spectrum of the organic framework. She was strength and gentleness hewn as one: "passion and order, innocence and maturity, defenselessness and strength, daughter and mother, maid and wife."[5] She represented simplicity in unity and the balance of the contraries. She was the mature integration of society and of nature as ideally reflected in the human being. She stood for unity, wholeness, and virtue—the utopian expression of human nature. Cordelia's nature was the human symbol of the new Jerusalem of the millenarian movements of the Middle Ages, the utopias of the Renaissance, and the religious sects of the subsequent civil war period in England, which attempted to improve society. The dialectical image of nature, here symbolized by a woman, represented the impetus to move society forward toward a new ideal.

Pastoral poetry and art prevalent in the Renaissance presented another image of nature as female—an escape backward into the motherly benevolence of the past. Here nature was a refuge from the ills and anxieties of urban life through a return to an unblemished Golden

Age. Depicted as a garden, a rural landscape, or a peaceful fertile scene, nature was a calm, kindly female, giving of her bounty. Against an idyllic backdrop, sheep grazed contently, birds sang melodies, and trees bore fruit. Wild animals, thorns, snakes, and vultures were nowhere to be found. Human beings meditated on the beauties of nature far removed from the violence of the city.[6]

The pastoral tradition had its roots in nostalgia for the Homeric Golden Age, for the uncorrupted Garden of Eden, and escape from the ills of the city. It echoed the poetic tradition of Virgil (70–19 B.C.) and Juvenal (A.D. 60–140). Virgil wrote of spending old age "amid familiar streams and holy springs";[7] Juvenal yearned for the rural town in which

> Springs bubbling up from the grass, no need
> for windlass or bucket,
> Plenty to water your flowers, if they need
> it without any trouble.[8]

The Arcadia theme, eulogized in the pastoral poetry of Philip Sidney (1554–86; *Arcadia,* 1590) and Edmund Spenser (1552–99; *The Shepheard's Calendar,* 1579), appeared in many poetic and artistic settings in which nature was idealized as a benevolent nurturer, mother, and provider. The sixteenth-century French painting "St. Genevieve with Her Flock" depicts the virgin surrounded by a flock of sheep within a protective stone circle on a hillside of trees and blooming flowers, well outside the city in the background. Here the female image of nature and the virgin, symbol of the earth spirit, are fused with the circular symbolism of order and protective encasement. In Lucas Cranach's painting "The Nymph of the Spring" (1518), the female earth nymph rests in a bed of flowers while doves, symbols of peace, feed near the edge of a trickling stream and deer water on its farther bank. The "Birth of Venus" (1482) and the "Primavera" (1477–78) of Sandro Botticelli portray the virgin in conjunction with the earth mother, who is covered with a gown and wreath of flowers, both symbols of female fertility. In the seventeenth century, Nicolas Poussin and other landscape painters illustrated the transitory nature of the Arcadian experience by sometimes inserting a death's head into their works of art.

But while the pastoral tradition symbolized nature as a benevolent female, it contained the implication that nature when plowed and cultivated could be used as a commodity and manipulated as a resource. Nature, tamed and subdued, could be transformed into a garden to provide both material and spiritual food to enhance the comfort and soothe the anxieties of men distraught by the demands of the urban world and the stresses of the marketplace. It depended on a masculine perception of nature as a mother and bride whose primary function was to comfort, nurture, and provide for the well-being of the male. In pastoral imagery, both nature and women are subordinate and essentially passive. They nurture but do not control or exhibit disruptive passion. The pastoral mode, although it viewed nature as benevolent, was a model created as an antidote to the pressures of urbanization and mechanization. It represented a fulfillment of human needs for nurture, but by conceiving of nature as passive, it nevertheless allowed for the possibility of its use and manipulation. Unlike the dialectical image of nature as the active unity of opposites in tension, the Arcadian image rendered nature passive and manageable.

PHILOSOPHICAL FRAMEWORKS. In his *Timaeus,* Plato endowed the whole world with life and likened it to an animal. The deity "framed one visible animal comprehending within itself all other animals of a kindred nature." Its shape was round, since it had no need for eyes, ears, or appendages. Its soul was female, "in origin and excellence prior to and older than the body," and made "to be ruler and mistress, of whom the body was to be the

subject." The soul permeated the corporeal body of the universe, enveloping it and "turning herself within herself." The earth "which is our nurse" was placed at the immovable center of the cosmos.[9]

For Plato, this female world soul was the source of motion in the universe, the bridge between the unchanging eternal forms and the changing, sensible, temporal lower world of nature. The Neoplatonism of Plotinus (A.D. 204–70), which synthesized Christian philosophy with Platonism, divided the female soul into two components. The higher portion fashioned souls from the divine ideas; the lower portion, *natura,* generated the phenomenal world. The twelfth-century Christian Cathedral School of Chartres, which interpreted the Bible in conjunction with the *Timaeus,* personified Natura as a goddess and limited the power attributed to her in pagan philosophies by emphasizing her subservience to God. Nature was compared to a midwife who translated Ideas into material things; the Ideas were likened to a father, the matter to a mother, and the generated species to a child. In Platonic and Neoplatonic symbolism, therefore, both nature and matter were feminine, while the Ideas were masculine. But nature, as God's agent, in her role as creator and producer of the material world, was superior to human artists both in creativity and in ease of production. She was more powerful than humans, but still subordinate to God.[10]

An allegory (1160) by Alain of Lille, of the School of Chartres, portrays Natura, God's powerful but humble servant, as stricken with grief at the failure of man (in contrast to other species) to obey her laws. Owing to faulty supervision by Venus, human beings engage in adulterous sensual love. In aggressively penetrating the secrets of heaven, they tear Natura's undergarments, exposing her to the view of the vulgar. She complains that "by the unlawful assaults of man alone the garments of my modesty suffer disgrace and division."

Natura was a replica of the cosmos. Set in her crown as jewels were the signs of the zodiac and the planets; decorating her robe, mantle, tunic, and undergarments were birds, water creatures, earth animals, herbs, and trees; on her shoes were flowers. Her torn tunic, indicative of the need to protect nature's secrets from misuse, exemplifies the rhetorical role of imagery. The specific moral of Alain's allegory is that nature has no power to enforce her own laws. After the disobedience that resulted in the fall of Adam and Eve, unity in the created world can only be maintained by moral choices; human reason must control human lust.[11]

Renaissance Neoplatonism illustrates the image of the macrocosm enlivened by the female soul. The Neoplatonic alchemist Robert Fludd (1574–1637) pictured the world soul as a woman connected by her right hand to God, represented by the Hebrew tetragrammaton—the four consonants JHVH—transmitted by a golden chain to the terrestrial world below. Natura was also pictured as the mother goddess Isis, her flowing hair drawn through a sphere representing the world, her mantle decorated at the top by stars and the bottom by flowers and her womb by a half-moon whose rays fertilize the earth. On opposite ears are the sun and moon, representing the male and female principles in the natural world. In her left hand she holds a pail, symbol of the flooding Nile, which irrigated the earth, and with her right she shakes the sistrum, a rattle representing the unceasing constant motion and internal vigor of nature.

The ancient philosophy of Aristotle, recovered in the twelfth century, was also based on the organic theory of the primacy of internal growth and development within nature. In his *Metaphysics,* Aristotle defined nature (*physis*) as "the source of movement of natural objects, being present in them either potentially or in complete reality."[12] Each individual object could be explained by specifying four "causes": material (the matter out of which it was made), formal (its shape or the arrangement of its parts), efficient (the moving force), and final (the purpose or ultimate end for which the object existed). In natural objects as opposed to artificially created products, the material and efficient causes were unified such that the

material substratum had its principle of motion or change within it. The material of a tree or a child caused its growth, whereas a table had to be produced by a builder. Motion, like growth, was the internal development of the potential toward the final form or actual existence of an individual being—a girl becomes a woman, a chicken develops into a hen. In nature the end toward which an object developed was its form or shape; in artificial products, such as a house, the form was distinct from its purpose as a dwelling.

Aristotle differed from the Presocratics, who defined nature in terms of a material substratum such as water (Thales, ca. 585 B.C.), air (Anaximenes, ca. 525 B.C.), fire (Heraclitus, ca. 478 B.C.), but he concurred with them in stressing the primacy of growth, change, and process in the natural world. He opposed Plato's dualism between imperfect appearances and pure perfect forms by asserting that the form existed in the individual object rather than as a separate transcendent level of reality.

Aristotelian philosophy, while unifying matter and form in each individual being, associated activity with maleness and passivity with femaleness. Form reigned superior over dead, passive matter. Socially, Aristotle found the basis for male rule over the household in the analogy that, as the soul ruled the body, so reason and deliberation, characteristic of men, should rule the appetites supposedly predominant in women.

Aristotle's biological theory viewed the female of the species as an incomplete or mutilated male, since the coldness of the female body would not allow the menstrual blood to perfect itself as semen. In the generation of offspring, the female contributed the matter or passive principle. This was the material on which the active male principle, the semen, worked in creating the embryo. The male was the real cause of the offspring. "The female, as female, is passive, and the male, as male, is active, and the principle of movement comes from him." Power and motion were contributed solely by the semen. The male supplied none of the matter from which the embryo developed: "Nor does he emit anything of such nature as to exist within that which is generated, as part of the material embryo, but that he only makes a living creature by the power which resides in the semen."[13]

The female supplied the nutriment—the catamenia, or menstrual blood—on which the qualities of the male could operate. The combination of semen with menstrual blood was like the curdling of cheese, just as rennet acts by coagulating milk. The male contributed the movement necessary for the embryo to develop, as well as the form it would take.

Both the efficient and formal causes were derived from the male principle and were the active cause of the offspring. Nature in her creative work used the semen as a tool just as the carpenter, through motion, imparted shape and form to the wood on which he worked. Since no material was ever transferred from the body of the carpenter to the wood, by analogy the male did not contribute any matter, but rather the force and power of the generation.

The Aristotelian theory of generation appeared at the basis of some alchemical theories. To change base metals to gold or silver, or to create the philosopher's stone—a substance thought to effect such a change—the qualities or form of the lowly metal must be removed, leaving the passive primary matter. The new more noble form, the active male principle, was then introduced and unified with the base female matter to produce the new metal.

Aristotelian ideas about human generation were also projected onto the cosmos. In the sixteenth century, the marriage and impregnation of the female earth by the higher celestial masculine heavens was a stock description of biological generation in nature. The movements of the celestial heavens produced semen, which fell in the form of dew and rain on the receptive female earth. A famous passage in *On the Revolutions of the Celestial Spheres* (1543) by Nicolaus Copernicus (1473–1543), reviver of the heliocentric hypothesis, draws on the marriage of the masculine heavens with the female earth: "Meanwhile, the earth conceives by the sun and becomes pregnant with annual offspring."[14] Such basic attitudes toward male-female roles in biological generation where the female and the earth are both

passive receptors could easily become sanctions for exploitation as the organic context was transformed by the rise of commercial capitalism.

A radical alternative to the hierarchical view that the female was inferior appeared in the monistic form of ancient gnosticism, based (like Shakespeare's Cordelia) on the unity of the opposites and the equality of male-female principles. The transmission of gnostic ideas of androgyny provided an alternative view of generation and carried with it more positive implications and attitudes toward nature as female in the Renaissance. But these ideas lay outside the mainstream of Western Christian culture. Gnostic texts available in the Renaissance had been preserved through extensive quotation in the polemical writings of the early church fathers who attempted to refute the doctrine.

The gnostic tradition was a body of texts (written in the first three centuries A.D.) condemned as a heretical form of early Christianity. Centered in hellenistic Alexandria, it synthesized Christianity with the spiritual teachings of Babylonia and Persia to the east, and Greece and Rome to the west. Gnosticism (stemming from *knowledge*) maintained an original unity of male-female opposites in a transcendent God, but a dualism between God and the mundane world, between good and evil, between spirit and matter. By emanation God produced a female generative principle, which created angels and then the visible world; the light of God mingled with matter in the lower world. The religious goal of gnosticism was other-worldy salvation through knowledge. In contrast to orthodox Christians, some sects worshipped the serpent for inducing Eve to taste the fruit of knowledge, the beginning of gnosis on earth. The coiled serpent biting its own tail symbolized the unity of the opposites good and bad, and the cosmic metamorphic cycles.

Some of the early gnostic Christians who described God as androgynous prayed to both the father and the mother and interpreted the account of the creation in the first chapter of Genesis to mean that a male-female God created men and women in its image. In these interpretations God was a dyad of opposites existing in harmony in one being. The divine mother was named Wisdom, or *Sophia,* a Greek translation of the Hebrew *hokhmah.* Wisdom was the creative power, "self-generating, self-discovering its own mother, its own father, its own sister, its own son: father, mother, unity, root of all things."[15] Her wisdom was bestowed on men and women. Human nature, like God, consisted of a unity of equal male-female principles. Evidence for the appeal of gnostic androgyny to women is indicated by their attraction to these heretical groups during the period A.D. 150–200, when Christianity was struggling to gain its stature as a world religion. Here they could play important roles from which they had been excluded by orthodox churches, including healer, evangelist, priest, prophet, and teacher.

Gnostic philosophy, and its assignment of equal importance to male and female principles in generation, permeated many alchemical treatises. The gnostic trinity—father, mother, and son—first appeared in a work of the third or fourth century, *Chrysopeia* ("Gold-Making"), attributed to Cleopatra. The *Emerald Tablet* of Hermes Trismegistus (a mythical alchemist to whom was attributed the gnostic *Corpus Hermeticum,* A.D. 100–300) emphasized the equality of the two great male and female principles in nature, the sun and moon: "The sun is its father, the moon is its mother. Wind is carried in its belly, the earth is its nurse."[16] In the gnostic tradition in alchemy many of the earliest alchemical treatises were either written by or attributed to women: Isis; Mary the Jewess, identified with Moses' sister Miriam; Cleopatra; and Theosobia, sister of Zosimus, an alchemist of the fourth century A.D.

> Noticeable also is the importance given to women by the Hermetic [alchemist]. In Majer's etching the virgin is, like her ancestor Eve, the instigator. And a woman is the alchemist's symbol of nature. He follows her tracks, which lead to perfection. It may be recalled that Magdalene and Sophia are the most

> important and active figures in the *Pistis Sophia* and that the earthly incarnation of the heavenly mother is the main feature in the dogma of Simon Magus. Flamel's transmutation took place when his wife was present; and in the *Liber Mutus,* an alchemical tract, it is recommended that before starting the operation the alchemist and his wife should kneel and pray before the oven. The union of the soul and spirit, of the male and female essence, has its counterpart in heaven: the sun is the father and the moon, the mother.[17]

In gnostic texts available in the sixteenth century, the Mother Sophia, or eightness, created the king or father, who in turn generated the seven heavens.[18] The mother produced four terrestrial elements after the pattern of the higher celestial elements. In some gnostic interpretations, the archetypal Adam was created androgynous and composed of eight parts.

For Paracelsus (1490–1541), the eight gnostic matrices were all mothers. Moreover, in contrast to Aristotle, he assigned equality to the male and female principles in sexual generation:

> When the seed is received in the womb, nature combines the seed of the man and the seed of the woman. Of the two seeds, the better and stronger will form the other, according to its nature. The seed from the man's brain and that from the woman's brain together make only one brain; but the child's brain is formed according to the one which is the stronger of the two, and it becomes like this seed but never completely like it.[19]

For some Paracelsians, the eight parts of the gnostic Adam were divided into four celestial fathers and four terrestial elements or mothers. The fathers provided astral semina that fertilized the female elemental matrices, which, activated by the central fire of the earth, rose up to receive the astral semina. For some alchemists, the philosopher's stone embodied the unity of the contraries resulting from the conjunction of the four mothers and the four fathers.

Scholar Ralph Cudworth noted in 1678 that the pagans "call God male and female together" and that "the Orphic theology calls the first principle hermaphroditic, or male and female together; thereby denoting that essence that is generative or productive of all things."[20]

In alchemy, permeated by male-female dualism, the hermaphrodite Mercurius symbolized the androgynous unity of the opposites. The unification of male and female principles, represented by the alchemical marriage of the sun and the moon and by the union of the male mineral agent mercury and the female *materia prima* (prime matter), resulted in the male-female hermaphrodite. The tree symbolized the vegetative nurturing principle; the snake, the animated life-giving principle. The heat of the alchemical oven represented the male element; the egg-shaped retort, the female womb.[21]

Thomas Vaughan (1622–66), alchemist and mystic, described the sun and the moon as two equal peers, the consummation of their marriage as a total unity resulting in the nurturing of their seed in the womb of the earth:

> There is in every star and in this elemental world a certain principle which is the "bride of the sun." These two in their coition do emit semen, which seed is carried in the womb of nature. But the ejection of it is performed invisibly and in a sacred silence, for this is the conjugal mystery of heaven and earth, their act of generation, a thing done in private between particular males and females; but how much more think you between the two universal natures. Know therefore

> that it is impossible for you to extract or receive any seed from the sun without this feminine principle which is the wife of the sun. . . . Know then for certain that the magician's sun and moon are two universal peers, male and female, a king and queen regents, always young and never old. These two are adequate to the whole world and coextended through the whole universe. The one is not without the other, God having united them in His work of creation in a solemn, sacramental union. It will then be a hard and difficult enterprise to rob the, husband of his wife, to part those asunder who God has put together, for they sleep both in the same bed, and he that discovers the one must needs see the other.[22]

What fate did these differing images of nature meet as the Scientific Revolution began to mechanize the world view? Both pastoral art and Aristotelian philosophy saw the female sex as passive and receptive. Pastoral imagery could easily be incorporated into a mechanized industrialized world as an escape from the frustrations of the marketplace. The pastoral had been an antidote to the ills of urbanization in ancient times, and it continued to play that role in the commercial revolution. It became particularly significant as an image dictating the transformation and cultivation of the wilderness in American culture. Explorers of the new world, who described the scenery as a lovely garden fragrant with flowers, brightened by the sounds of marvelous new and beautiful birds, provided an impetus for settlement across the Atlantic. The cultivation of a bountiful mother earth helped to hasten the disruption and exploitation of new and "virgin" lands.

The Aristotelian and Platonic conception of the passivity of matter could also be incorporated into the new mechanical philosophy in the form of inert "dead" atoms, constituents of a new machinelike world in which change came about through external forces, a scheme that readily sanctioned the manipulation of nature. The Neoplatonic female world soul, the internal source of activity in nature, would disappear, to be replaced by a carefully contrived mechanism of subtle particles in motion.

The idea of the androgynous equality of male-female principles would eventually become more clearly articulated as the principle of the dialectic, either as the unity of opposites in idealism or as the struggle of the opposites in dialectical materialism. I will have occasion to note its progress in several social and philosophical contexts as the struggle for equality, against social hierarchy, continued.

THE GEOCOSM: THE EARTH AS A NURTURING MOTHER. Not only was nature in a generalized sense seen as female, but also the earth, or geocosm, was universally viewed as a nurturing mother, sensitive, alive, and responsive to human action. The changes in imagery and attitudes relating to the earth were of enormous significance as the mechanization of nature proceeded. The nurturing earth would lose its function as a normative restraint as it changed to an inanimate dead physical system.

The macrocosm theory, as we have seen, likened the cosmos to the human body, soul, and spirit with male and female reproductive components. Similarly, the geocosm theory compared the earth to the living human body, with breath, blood, sweat, and elimination systems.

For the Stoics, who flourished in Athens during the third century B.C., after the death of Aristotle, and in Rome through the first century A.D., the world itself was an intelligent organism; God and matter were synonymous. Matter was dynamic, composed of two forces: expansion and condensation—the former directed outward, the latter inward. The tension between them was the inherent force generating all substances, properties, and living forms in the cosmos and the geocosm.

Zeno of Citium (ca. 304 B.C.) and M. Tullius Cicero (106–43 B.C.) held that the world reasons, has sensation, and generates living rational beings: "The world is a living and wise being, since it produces living and wise beings."[23] Every part of the universe and the earth was created for the benefit and support of another part. The earth generated and gave stability to plants, plants supported animals, and animals in turn served human beings; conversely, human skill helped to preserve these organisms. The universe itself was created for the sake of rational beings—gods and men—but God's foresight insured the safety and preservation of all things. Humankind was given hands to transform the earth's resources and was given dominion over them: timber was to be used for houses and ships, soil for crops, iron for plows, and gold and silver for ornaments. Each part and imperfection existed for the sake and ultimate perfection of the whole.

The living character of the world organism meant not only that the stars and planets were alive, but that the earth too was pervaded by a force giving life and motion to the living beings on it. Lucius Seneca (4 B.C.–A.D. 65), a Roman Stoic, stated that the earth's breath nourished both the growths on its surface and the heavenly bodies above by its daily exhalations:

> How could she nourish all the different roots that sink into the soil in one place and another, had she not an abundant supply of the breath of life? . . . all these [heavenly bodies] draw their nourishment from materials of earth . . . and are sustained . . . by nothing else than the breath of the earth. . . . Now the earth would be unable to nourish so many bodies . . . unless it were full of breath, which it exhales from every part of it day and night.[24]

The earth's springs were akin to the human blood system; its other various fluids were likened to the mucus, saliva, sweat, and other forms of lubrication in the human body, the earth being organized ". . . much after the plan of our bodies, in which there are both veins and arteries, the former blood vessels, the latter air vessels. . . . So exactly alike is the resemblance to our bodies in nature's formation of the earth, that our ancestors have spoken of veins [springs] of water." Just as the human body contained blood, marrow, mucus, saliva, tears, and lubricating fluids, so in the earth there were various fluids. Liquids that turned hard became metals, such as gold and silver; other fluids turned into stones, bitumens, and veins of sulfur. Like the human body, the earth gave forth sweat: "There is often a gathering of thin, scattered moisture like dew, which from many points flows into one spot. The dowsers call it *sweat*, because a kind of drop is either squeezed out by the pressure of the ground or raised by the heat."

Leonardo da Vinci (1452–1519) enlarged the Greek analogy between the waters of the earth and the ebb and flow of human blood through the veins and heart:

> The water runs from the rivers to the sea and from the sea to the rivers, always making the same circuit. The water is thrust from the utmost depth of the sea to the high summits of the mountains, where, finding the veins cut, it precipitates itself and returns to the sea below, mounts once more by the branching veins and then falls back, thus going and coming between high and low, sometimes inside, sometimes outside. It acts like the blood of animals which is always moving, starting from the sea of the heart and mounting to the summit of the head.[25]

The earth's venous system was filled with metals and minerals. Its veins, veinlets, seams, and canals coursed through the entire earth, particularly in the mountains. Its humors flowed from the veinlets into the larger veins. The earth, like the human, even had its

own elimination system. The tendency for both to break wind caused earthquakes in the case of the former and another type of quake in the latter:

> The material cause of earthquakes . . . is no doubt great abundance of wind, or store of gross and dry vapors, and spirits, fast shut up, and as a man would say, emprisoned in the caves, and dungeons of the earth; which wind, or vapors, seeking to be set at liberty, and to get them home to their natural lodgings, in a great fume, violently rush out, and as it were, break prison, which forcible eruption, and strong breath, causeth an earthquake.[26]

Its bowels were full of channels, fire chambers, glory holes, and fissures through which fire and heat were emitted, some in the form of fiery volcanic exhalations, others as hot water springs. The most commonly used analogy, however, was between the female's reproductive and nurturing capacity and the mother earth's ability to give birth to stones and metals within its womb through its marriage with the sun.

In his *De Rerum Natura* of 1565, the Italian philosopher Bernardino Telesio referred to the marriage of the two great male and female powers: "We can see that the sky and the earth are not merely large parts of the world universe, but are of primary—even principal rank. . . . They are like mother and father to all the others."[27] The earth and the sun served as mother and father to the whole of creation: all things are "made of earth by the sun and that in the constitution of all things the earth and the sun enter respectively as mother and father." According to Giordano Bruno (1548–1600), every human being was "a citizen and servant of the world, a child of Father Sun and Mother Earth."[28]

A widely held alchemical belief was the growth of the baser metals into gold in womb-like matrices in the earth. The appearance of silver in lead ores or gold in silvery assays was evidence that this transformation was under way. Just as the child grew in the warmth of the female womb, so the growth of metals was fostered through the agency of heat, some places within the earth's crust being hotter and therefore hastening the maturation process. "Given to gold, silver, and the other metals [was] the vegetative power whereby they could also reproduce themselves. For, since it was impossible for God to make anything that was not perfect, he gave to all created things, with their being, the power of multiplication."[29] The sun acting on the earth nurtured not only the plants and animals but also "the metals, the broken sulfuric, bituminous, or nitrogenous rocks; . . . as well as the plants and animals—if these are not made of earth by the sun, one cannot imagine of what else or by what other agent they could be made."[30]

Several theories accounted for the growth of metals and minerals. In the Aristotelian theory, the earth gave off exhalations under the influence of the sun's warmth. From the dry exhalations grew stones, from the wet metals, both being formed within the earth or on its surface. Sixteenth-century theories held that minerals grew from a combination of celestial influences, primarily the sun, and a formative power within the earth.[31]

In the liquid seed theory, the earth was a matrix or mother to the seeds of stones and minerals. The seeds of minerals and metals fermented water, transforming it into a mineral juice and then into the metal itself. Stones were generated from their own seminal principles or seeds, thereby preserving their species. Suitable nooks and crannies within the earth formed matrices or wombs for the nurturing and development of the infant seed. Neither the air nor the bodies of plants and animals were suitable mothers; only the rocks on the edges of ore veins, and special crannies in the earth's crust could act as matrices. Jerome Cardan (1550) and Bernard Palissy (1580) believed that metals reproduced by liquid seeds deposited by water; others set forth the thesis that mineral juices were formed into metals by degrees, expanding and taking on new matter until they grew into visible metals.[32]

A third theory, the lapidifying (stone-forming) juice theory, hypothesized a fluid or juice that circulated through the earth's body in the veins, and cracks, and pores beneath its surface just as blood ebbed and flowed within the human body. This *succus lapidescens,* combined with the principles of heat and cold, was the origin of stones and minerals. The mineral or stony matter was held in solution by the liquid *succus* until it evaporated out by the action of heat or deposited its matter through the action of cold.[33]

The earth's womb was the matrix or mother not only of metals but also of all living things. Paracelsus compared the earth to a female whose womb nurtured all life.

> Woman is like the earth and all the elements and in this sense she may be considered a matrix; she is the tree which grows in the earth and the child is like the fruit born of the tree. . . . Woman is the image of the tree. Just as the earth, its fruits, and the elements are created for the sake of the tree and in order to sustain it, so the members of woman, all her qualities, and her whole nature exist for the sake of her matrix, her womb . . . .
>
> And yet woman in her own way is also a field of the earth and not at all different from it. She replaces it, so to speak; she is the field and the garden mold in which the child is sown and planted.[34]

The earth in the Paracelsian philosophy was the mother or matrix giving birth to plants, animals, and men.

The image of the earth as a nurse, which had appeared in the ancient world in Plato's *Timeaus* and the *Emerald Tablet* of Hermes Trismegistus, was a popular Renaissance metaphor. According to sixteenth-century alchemist Basil Valentine, all things grew in the womb of the earth, which was alive, and vital, and the nurse of all life:

> The quickening power of the earth produces all things that grow forth from it, and he who says that the earth has no life makes a statement flatly contradicted by facts. What is dead cannot produce life and growth, seeing that it is devoid of the quickening spirit. . . . This spirit is the life and soul that dwell in the earth, and are nourished by heavenly and sidereal influences. . . . This spirit is itself fed by the stars and is thereby rendered capable of imparting nutriment to all things that grow and of nursing them as a mother does her child while it is yet in the womb. . . . If the earth were deserted by this spirit it would be dead . . . .[35]

Cambridge Platonist Henry More (1614–87) referred to the sixteenth-century doctrine of the earth as a nurse and the possibility of its going dry and becoming sterile:

> For though we should admit, with Cardan and other naturalists, that the earth at first brought forth all manner of animals as well as plants, and that they might be fastened by the navel to their common mother the earth, as they are now to the female in the womb; yet we see she is grown sterile and barren, and her births of animals are now very inconsiderable. Wherefore what can it be but a providence, that while she did bear she sent out male and female, that when her own prolific virtue was wasted, yet she might be a dry nurse, or an officious grandmother, to thousands of generations?[36]

In general, the Renaissance view was that all things were permeated by life, there being no adequate method by which to designate the inanimate from the animate. It was difficult to

differentiate between living and nonliving things, because of the resemblance in structures. Like plants and animals, minerals and gems were filled with small pores, tublets, cavities, and streaks, through which they seemed to nourish themselves. Crystalline salts were compared to plant forms, but criteria by which to differentiate the living from the nonliving could not successfully be formulated. This was due not only to the vitalistic framework of the period but to striking similarities between them. Minerals were thought to possess a lesser degree of the vegetative soul, because they had the capacity for medicinal action and often took the form of various parts of plants. By virtue of the vegetative soul, minerals and stones grew in the human body, in animal bodies, within trees, in the air and water, and on the earth's surface in the open country.[37]

Popular Renaissance literature was filled with hundreds of images associating nature, matter, and the earth with the female sex. The earth was alive and considered to be a beneficent, receptive, nurturing female. For most writers there was a mingling of traditions based on ancient sources. In general, the pervasive animism of nature created a relationship of immediacy with the human being. An I-thou relationship in which nature was considered to be a person-writ-large was sufficiently prevalent that the ancient tendency to treat it as another human still existed. Such vitalistic imagery was thus so widely accepted by the Renaissance mind that it could effectively function as a restraining ethic.

In much the same way, the cultural belief-systems of many American-Indian tribes had for centuries subtly guided group behavior toward nature. Smohalla of the Columbia Basin Tribes voiced the Indian objections to European attitudes in the mid-1800s:

> You ask me to plow the ground! Shall I take a knife and tear my mother's breast? Then when I die she will not take me to her bosom to rest.
>
> You ask me to dig for stone! Shall I dig under her skin for her bones? Then when I die I cannot enter her body to be born again.
>
> You ask me to cut grass and make hay and sell it, and be rich like white men! But how dare I cut off my mother's hair?[38]

In the 1960s, the Native-American became a symbol in the ecology movement's search for alternatives to Western exploitative attitudes. The Indian animistic belief-system and reverence for the earth as a mother were contrasted with the Judeo-Christian heritage of dominion over nature and with capitalist practices resulting in the "tragedy of the commons" (exploitation of resources available for any person's or nation's use). But as will be seen, European culture was more complex and varied than this judgment allows. It ignores the Renaissance philosophy of the nurturing earth as well as those philosophies and social movements resistant to mainstream economic change.

NORMATIVE CONSTRAINTS AGAINST THE MINING OF MOTHER EARTH. If sixteenth-century descriptive statements and imagery can function as an ethical constraint and if the earth was widely viewed as a nurturing mother, did such imagery actually function as a norm against improper use of the earth? Evidence that this was indeed the case can be drawn from theories of the origins of metals and the debates about mining prevalent during the sixteenth century.

The ancient Greek philosophers Anaxagoras (500–428 B.C.), Theophrastus (370–278 B.C.), and Dionysius of Periegetes (fl. A.D. 86–96) believed that metals were plants growing beneath the earth's surface and that veins of gold were like the roots and branches of trees. Metals were believed merely to be a lower form of life than vegetables and animals, reproducing themselves through small metallic seeds.

A popular Renaissance belief held about mining was the metaphor of the golden tree. The earth deep within its bowels produced and gave form to the metals, which then rose as

mist up through the trunk, branches, and twigs of a great tree whose roots originated at the earth's center. The large branches contained the great veins of minerals, the smaller the metallic ores. Miners had

> . . . found by experience that the vein of gold is a living tree and that by all ways that it spreadeth and springeth from the root by the soft pores and passages of the earth putting forth branches even unto the uppermost part of the earth and ceaseth not until it discover itself unto the open air: at which time it showeth forth certain beautiful colors instead of flowers, round stones of golden earth instead of fruits and thin plates instead of leaves.[39]

Once the veins of ore were mined, it was believed that new ore grew again within a few years. Diamond mines in the East Indies were filled with new diamonds; sulfur mines were soon replenished. Iron ore continued to grow in the mines of Elba off the coast of Italy; the iron ore fields of Saga in Germany refilled within ten years. Silver twigs resembling plants grew in the shafts of abandoned mines in the Joachim Valley. In his *Art of Metals* (1640), Albaro Barba, director of the Potosi mines in the Spanish West Indies, wrote, "All of us know that in the rich hill at Potosi the stones, which divers years we have left behind us, thinking there was not plate enough in them to make it worth our labor, we now bring home and find abundant plate in them, which can be attributed to nothing but the perpetual generation of silver."[40] The image of Mother Earth and her generative role in the production of metals continued to be significant well into the eighteenth century.

What ethical ideas were held by ancient and early modern writers on the extraction of the metals from the bowels of the living earth? The Roman compiler Pliny (A.D. 23–79), in his *Natural History,* had specifically warned against mining the depths of Mother Earth, speculating that earthquakes were an expression of her indignation at being violated in this manner:

> We trace out all the veins of the earth, and yet . . . are astonished that it should occasionally cleave asunder or tremble: as though, forsooth, these signs could be any other than expressions of the indignation felt by our sacred parent! We penetrate into her entrails, and seek for treasures . . . as though each spot we tread upon were not sufficiently bounteous and fertile for us![41]

He went on to argue that the earth had concealed from view that which she did not wish to be disturbed, that her resources might not be exhausted by human avarice:

> For it is upon her surface, in fact, that she has presented us with these substances, equally with the cereals, bounteous and ever ready, as she is, in supplying us with all things for our benefit! It is what is concealed from our view, what is sunk far beneath her surface, objects, in fact, of no rapid formation, that urge us to our ruin, that send us to the very depths of hell. . . . when will be the end of thus exhausting the earth, and to what point will avarice finally penetrate!

Here, then, is a striking example of the restraining force of the beneficent mother image—the living earth in her wisdom has ordained against the mining of metals by concealing them in the depths of her womb. In addition the mining of gold contributed to human corruption and avarice. "The worst crime against mankind [was] committed by him who was the first to put a ring upon his fingers." In the age of barter, people were happy, but since then "man has learned how to challenge both nature and art to become the incitements to vice!"

While mining gold led to avarice, extracting iron was the source of human cruelty in the form of war, murder, and robbery. Its use should be limited to agriculture and those activities that contributed to the "honors of more civilized life":

> For by the aid of iron we lay open the ground, we plant trees, we prepare our vineyard trees, and we force our vines each year to resume their youthful state, by cutting away their decayed branches. It is by the aid of iron that we construct houses, cleave rocks, and perform so many other useful offices of life. But it is with iron also that wars, murders, and robberies are effected, . . . not only hand to hand, but . . . by the aid of missiles and winged weapons, now launched from engines, now hurled by the human arm, and now furnished with feathery wings. Let us therefore acquit nature of a charge that here belongs to man himself.

In past history, Pliny stated, there had been instances in which laws were passed to prohibit the retention of weapons and to ensure that iron was used solely for innocent purposes, such as the cultivation of fields.

In the *Metamorphoses* (A.D. 7), the Roman poet Ovid wrote of the violence done to the earth during the age of iron. In the preceding Golden Age, "people were unaggressive, and unanxious."

> And Earth, untroubled,
> Unharried by hoe or plowshare, brought forth all
> That men had need for, and those men were happy,
> Gathering berries from the mountain sides,
> Cherries, or black caps, and the edible acorns.
> Spring was forever, with a west wind blowing
> Softly across the flowers no man had planted,
> And Earth, unplowed, brought forth rich grain; the field,
> Unfallowed, whitened with wheat, and there were rivers
> Of milk, and rivers of honey, and golden nectar
> Dripped from the dark-green oak-trees.[42]

During the Iron Age, evil was let loose in the form of trickery, slyness, plotting, swindling, and violence, as men dug into the earth's entrails for iron and gold:

> The rich earth
> Was asked for more; they dug into her vitals,
> Pried out the wealth a kinder lord had hidden
> In stygian shadow, all that precious metal,
> The root of evil. They found the guilt of iron,
> And gold, more guilty still. And War came forth.

The violation of Mother Earth resulted in new forms of monsters, born of the blood of her slaughter:

> Jove struck them down
> With thunderbolts, and the bulk of those huge bodies
> Lay on the earth, and bled, and Mother Earth,
> Made pregnant by that blood, brought forth new bodies,
> And gave them, to recall her older offspring,

> The forms of men. And this new stock was also
> Contemptuous of gods, and murder-hungry
> And violent. You would know they were sons of blood.

Seneca also deplored the activity of mining, although, unlike Pliny and Ovid, he did not consider it a new vice, but one that had been handed down from ancient times. "What necessity caused man, whose head points to the stars, to stoop, below, burying him in mines and plunging him in the very bowels of innermost earth to root up gold?" Not only did mining remove the earth's treasures, but it created "a sight to make [the] hair stand on end—huge rivers and vast reservoirs of sluggish waters." The defiling of the earth's waters was even then a noteworthy consequence of the quest for metals.[43]

These ancient strictures against mining were still operative during the early years of the commercial revolution when mining activities, which had lapsed after the fall of Rome, were once again revived. Ultimately, such constraints would have to be defeated by proponents of the new mercantilist philosophy.[44]

An allegorical tale, reputedly sent to Paul Schneevogel, a professor at Leipzig about 1490–95, expressed opposition to mining encroachments into the farmlands of Lichtenstat in Saxony, Germany, an area where the new mining activities were developing rapidly. Reminiscent of Alain of Lille's *Natura* and her torn gown and illustrative of the force of the ancient strictures against mining is the following allegorical vision of an old hermit of Lichtenstat. Mother Earth, dressed in a tattered green robe and seated on the right hand of Jupiter, is represented in a court case by "glib-tongued Mercury" who charges a miner with matricide. Testimony is presented by several of nature's deities:

> Bacchus complained that his vines were uprooted and fed to the flames and his most sacred places desecrated. Ceres stated that her fields were devastated; Pluto that the blows of the miners resound like thunder through the depths of the earth, so that he could hardly reside in his own kingdom; the Naiad, that the subterranean waters were diverted and her fountains dried up; Charon that the volume of the underground, waters had been so diminshed that he was unable to float his boat on Acheron and carry the souls across to Pluto's realm, and the Fauns protested that the charcoal burners had destroyed whole forests to obtain fuel to smelt the miner's ores.[45]

In his defense, the miner argued that the earth was not a real mother, but a wicked stepmother who hides and conceals the metals in her inner parts instead of making them available for human use.

The final judgment, handed down by Fortune, stated that if men deign "to mine and dig in mountains, to tend the fields, to engage in trade, to injure the earth, to throw away knowledge, to disturb Pluto and finally to search for veins of metal in the sources of rivers, their bodies ought to be swallowed up by the earth, suffocated by its vapors . . . intoxicated by wine, . . . afflicted with hunger and remain ignorant of what is best. These and many other dangers are proper of men. Farewell."

In the old hermit's tale, we have a fascinating example of the relationship between images and values. The older view of nature as a kindly mother is challenged by the growing interests of the mining industry in Saxony, Bohemia, and the Harz Mountains, regions of newly found prosperity. The miner, representing these newer commercial activities, transforms the image of the nurturing mother into that of a stepmother who wickedly conceals her bounty from the deserving and needy children. In the seventeenth century, the image will be seen to undergo yet another transformation, as natural philosopher Francis Bacon

(1561–1626) sets forth the need for prying into nature's nooks and crannies in searching out her secrets for human improvement.

Henry Cornelius Agrippa's polemic *The Vanity of Arts and Sciences* (1530) reiterated some of the moral strictures against mining found in the ancient treatises, quoting the passage from Ovid portraying miners digging into the bowels of the earth in order to extract gold and iron. "These men," he declared, "have made the very ground more hurtful and pestiferous, by how much they are more rash and venturous than they that hazard themselves in the deep to dive for pearls." Mining thus despoiled the earth's surface, infecting it, as it were, with an epidemic disease. Of all cultures that have mined for metals, "only the Scythians . . . condemned the use of gold and silver, resolving to keep themselves eternally free from public avarice. There was an ancient law among the Romans against the superfluity of gold. And indeed, it were to be wished that men would aspire with the same eagerness to heaven, that they descend into the bowels of the earth, allured with that vein of riches that are so far from making a man happy, that they repent too often of their time and labor so ill bestowed."[46]

If mining were to be freed of such strictures and sanctioned as a commercial activity, the ancient arguments would have to be refuted. This task was taken up by Georg Agricola (1494–1555), who wrote the first "modern" treatise on mining. His *De Re Metallica* ("On Metals," 1556) marshalled the arguments of the detractors of mining in order to refute them and thereby promote the activity itself.

According to Agricola, people who argued against the mining of the earth for metals did so on the basis that nature herself did not wish to be discovered what she herself had concealed:

> The earth does not conceal and remove from our eyes those things which are useful and necessary to mankind, but, on the contrary, like a beneficent and kindly mother she yields in large abundance from her bounty and brings into the light of day the herbs, vegetables, grains, and fruits, and trees. The minerals, on the other hand, she buries far beneath in the depth of the ground, therefore they should not be sought.[47]

This argument, taken directly from Pliny, reveals the normative force of the image of the earth as a nurturing mother.

A second argument of the detractors, reminiscent of Seneca and Agrippa, and based on Renaissance "ecological" concerns was the disruption of the natural environment and the pollutive effects of mining.

> But, besides this, the strongest argument of the detractors [of mining] is that the fields are devastated by mining operations, for which reason formerly Italians were warned by law that no one should dig the earth for metals and so injure their very fertile fields, their vineyards, and their olive groves. Also they argue that the woods and groves are cut down, for there is need of wood for timbers, machines, and the smelting of metals. And when the woods and groves are felled, then are exterminated the beasts and birds, many of which furnish a pleasant and agreeable food for man. Further, when the ores are washed, the water which has been used poisons the brooks and streams, and either destroys the fish or drives them away. Therefore the inhabitants of these regions, on account of the devastation of their fields, woods, groves, brooks, and rivers, find great difficulty in procuring the necessaries of life, and by reason of the destruction of the timber they are forced to greater expense in erecting buildings. Thus it is said, it is clear to all that there is greater detriment from mining than the value of the metals which the mining produces.

Agricola may have been alluding to laws passed by the Florentines between 1420 and 1485, preventing people from dumping lime into rivers upstream from the city for the purpose of "poisoning or catching fish," as it caused severe problems for those living downstream. The laws were enacted both to preserve the trout, "a truly noble and impressive fish" and to provide Florence with "a copious and abundant supply of such fish." But these laws passed to safeguard the waters of the Arno and the areas of the Castino and Pistoian Apennines were not obeyed, and complaints mounted· that "the rivers are empty of fish, and the fish are worse." By 1477, new laws protected the entire domain around Florence, includingthe Arno, Sieve, and Serchio rivers and their tributaries, from the diverting and damming of rivers and the poisoning of fish with lime, nutshells, or the reputedly toxic Aaron's Rod plant.[48]

Such ecological consciousness, however, suffered because of the failure of law enforcement, as well as because of the continuing progress of mining activities. Agricola, in his response to the detractors of mining, pointed out the congruences in the need to catch fish and to construct metal tools for the well-being of the human race. His effort can be interpreted as an attempt to liberate the activity of mining from the constraints imposed by the organic framework and the nurturing earth image, so that new values could sanction and hasten its development and progress.

To the argument that, because the metals lie in the earth "enclosed and hidden from sight [and] should not be taken out," Agricola countered with the example of catching fish, which lie concealed in the depths of the waters.[49] "Nature has given the earth . . . to man that he might cultivate it and draw out of its caverns metals and other mineral products," without which the earth could not be cultivated, fish caught, sheep sheared, animals slaughtered, or food cooked. Without the metals, men would "return to the acorns and fruits and berries of the forest. They would feed upon the herbs and roots which they plucked up with their nails. They would dig out caves in which to lie down at night, a . . . condition . . . utterly unworthy of humanity, with its splendid and glorious natural endowment."

To the argument that the woods were cut down and the price of timber therefore raised, Agricola responded that most mines occurred in unproductive, gloomy areas. Where the trees were removed from more productive sites, fertile fields could be created, the profits from which would reimburse the local inhabitants for their losses in timber supplies. Where the birds and animals had been destroyed by mining operations, the profits could be used to purchase "birds without number" and "edible beasts and fish elsewhere" and refurbish the area.

The vices associated with the metals—anger, cruelty, discord, passion for power, avarice, and lust—should be attributed instead to human conduct: "It is not the metals which are to be blamed, but the evil passions of men which become inflamed and ignited; or it is due to the blind and impious desires of their minds." Agricola's arguments are a conscious attempt to separate the older normative constraints from the image of the metals themselves so that new values can then surround them.

Edmund Spenser's treatment of Mother Earth in the *Faerie Queen* (1595) was representative of the concurrent conflict of attitudes about mining the earth. Spenser entered fully into the sixteenth-century debates about the wisdom of mining, the two greatest sins against the earth being, according to him, avarice and lust. The arguments associating mining with avarice had appeared in the ancient texts of Pliny, Ovid, and Seneca, while during Spenser's lifetime the sermons of Johannes Mathesius, entitled *Bergpostilla, oder Sarepta* (1578), inveighed against the moral consequences of human greed for the wealth created by mining for metals.[50]

In Spenser's poem, Guyon presents the arguments against mining taken from Ovid and Agricola, while the description of Mammon's forge is drawn from the illustrations to the *De Re Metallica*. Gold and silver pollute the spirit and debase human values just as the mining operation itself pollutes the "purest streams" of the earth's womb:

Then gan a cursed hand the quiet wombe
Of his great Grandmother with Steele to wound,
And the hid treasures in her sacred tombe
With Sacrilege to dig. Therein he found
Fountaines of gold and silver to abound,
Of which the matter of his huge desire
And pompous pride eftsoones he did compound.[51]

The earth in Spenser's poem is passive and docile, allowing all manner of assault, violence, ill-treatment, rape by lust, and despoilment by greed. No longer a nurturer, she indiscriminately, as in Ovid's verse, supplies flesh to all life and lacking in judgment brings forth monsters and evil creatures. Her offspring fall and bite her in their own death throes. The new mining activities have altered the earth from a bountiful mother to a passive receptor of human rape.

John Milton's *Paradise Lost* (1667) continues the Ovidian image, as Mammon leads "bands of pioners with Spade and Pickaxe" in the wounding of the living female earth:

. . . By him first
Men also, and by his suggestion taught,
Ransack'd the Center, and with impious hands
Rifl'd the bowels of thir mother Earth
For Treasures better hid. Soon had his crew
Op'nd into the Hill a spacious wound
And dig'd out ribs of Gold.[52]

Not only did mining encourage the moral sin of avarice, it was compared by Spenser to the second great sin, human lust. Digging into the matrices and pockets of earth for metals was like mining the female flesh for pleasure. The sixteenth- and seventeenth-century imagination perceived a direct correlation between mining and digging into the nooks and crannies of a woman's body. Both mining and sex represent for Spenser the return to animality and earthly slime. In the *Faerie Queen,* lust is the basest of all human sins. The spilling of human blood, in the rush to rape the earth of her gold, taints and muddies the once fertile fields.

The sonnets of the poet and divine John Donne (1573–1631) also played up the popular identity of mining with human lust. The poem "Love's Alchemie" begins with the sexual image, "Some that have deeper digged loves Myne than I,/say where his centrique happiness doth lie."[53] The Platonic lover, searching for the ideal or "centrique" experience of love, begins by digging for it within the female flesh, an act as debasing to the human being as the mining of metals is to the female earth. Happiness is not to be obtained by avarice for gold and silver, nor can the alchemical elixir be produced from base metals. Nor does ideal love result from an ascent up the hierarchical ladder from base sexual love to the love of poetry, music, and art to the highest Platonic love of the good, virtue, and God.

The same equation appears in Elegie XVIII, "Love's Progress":

Search every spheare
And firmament, our Cupid is not there:
He's an infernal god and under ground,
With Pluto dwells, where gold and fire abound:
Men to such Gods, their sacrificing Coles,
Did not in Altars lay, but pits and holes.
Although we see Celestial bodies move

> Above the earth, the earth we Till and love:
> So we her ayres contemplate, words and heart
> And virtues; but we love the Centrique part.[54]

Lust and love of the body do not lead to the celestial love of higher ideals; rather, physical love is associated with the pits and holes of the female body, just as the love of gold depends on the mining of Pluto's caverns within the female earth, "the earth we till and love." Love of the sexual "centrique" part of the female will not lead to the aery spiritual love of virtue. The fatal association of monetary revenue with human avarice, lust, and the female mine is driven home again in the last lines of the poem:

> Rich Nature hath in women wisely made
> Two purses, and their mouths aversely laid:
> They then, which to the lower tribute owe,
> That way which that Exchequer looks, must go.

Avarice and greed after money corrupted the soul, just as lust after female flesh corrupted the body.

The comparison of the female mine with the new American sources of gold, silver, and precious metals appears again in Elegie XIX, "Going to Bed." Here, however, Donne turns the image upside down and uses it to extoll the virtues of the mistress:

> License my roaving hands, and let them go,
> Before, behind, between, above, below.
> O my America! my new-found-land,
> My kingdome, safelist when with one man man'd
> My Myne of precious stones, My Emperie,
> How blest am I in this discovering thee!

In these lines, the comparison functions as a sanction—the search for precious gems and metals, like the sexual exploration of nature or the female, can benefit a kingdom or a man.

Moral restraints were thus clearly affiliated with the Renaissance image of the female earth and were strengthened by associations with greed, avarice, and lust. But the analogies were double-edged. If the new values connected with mining were positive, and mining was viewed as a means to improve the human condition, as they were by Agricola, and later by Bacon, then the comparison could be turned upside down. Sanctioning mining sanctioned the rape or commercial exploration of the earth—a clear illustration of how constraints can change to sanctions through the demise of frameworks and their associated values as the needs, wants, and purposes of society change: The organic framework, in which the Mother Earth image was a moral restraint against mining, was literally undermined by the new commercial activity.

Notes

1 On the tensions between technology and the pastoral ideal in American culture, see Leo Marx, *The Machine in the Garden* (New York: Oxford University Press, 1964). On the domination of nature as female, see Annette Kolodny, *The Lay of the Land* (Chapel Hill: University of North Carolina Press, 1975); Rosemary Radford Ruether, "Women, Ecology, and the Domination of Nature," *The Ecumenist* 14 (1975): 1–5; William Leiss, *The Domination of Nature* (New York: Braziller, 1972). On the roots of the ecological crisis, see Donald Hughes, *Ecology in Ancient Civilizations* (Albuquerque: University

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2 Stanley Cavell, "Must We Mean What We Say?" in Colin Lyas, ed., *Philosophy and Linguistics* (London: Macmillan, 1971), pp. 131–65; see esp. 148, 165. On frameworks and values see Charles Taylor, "Neutrality in Political Science," in Alan Ryan, ed., *The Philosophy of Social Explanation* (London: Oxford University Press, 1973) pp. 139–70, see esp. pp. 144–46, 154–55.

3 On the Elizabethan view of nature and Shakespeare's *King Lear,* see John Danby, *Shakespeare's Doctrine of Nature: A Study of King Lear* (London: Faber and Faber, 1949), pp. 20–21, 26, 28, 133, 126.

4 Richard Hooker, *Of the Laws of Ecclesiastical Polity*, ed. W. Speed Hill (Cambridge, Mass.: Harvard University Press, 1977, first published, 1594): Bk. I, Chap. 3.3, p. 66, Chap. 3.4, p. 68; Chap. 8, pp. 3–5. Danby, pp. 24–27. Eustace M. W. Tillyard, *The Elizabethan World Picture* (New York: Random House Vintage, 1959 [?]), p. 46.

5 Danby, p. 133. The interpretation of Cordelia is Danby's.

6 The discussion of the pastoral tradition draws on Joseph W. Meeker, *The Comedy of Survival: Studies in Literary Ecology* (New York: Scribner's, 1972), pp, 81–89, and L. Marx, *The Machine in the Garden,* pp. 26, 28–29, 36–43. Also relevant are Walter W. Greg, *Pastoral Poetry and Pastoral Drama* (London: Bullen, 1906); William Empson, *Some Versions of the Pastoral* (London: Chatto & Windus, 1950); Michael Putnam, *Virgil's Pastoral Art: Studies in the Eclogues* (Princeton, N.J.: Princeton University Press, 1970); Bruno Snell, "Arcadia: The Discovery of a Spiritual Landscape," in *The Discovery of the Mind: The Greek Origins of European Thought,* trans. T. G. Rosenmeyer (Oxford: Blackwell, 1953); Hallett Smith, "Pastoral Poetry," *Elizabethan Poetry: A Study in Conventions, Meanings, and Expression* (Cambridge, Mass.: Harvard University Press, 1952); Erwin Panofsky, "Et in Arcadia Ego: Poussin and the Elegaic Tradition," in *Meaning in the Visual Arts: Papers in and on Art History* (Garden City, N.Y.: Doubleday, 1957).

7 Quoted in Meeker, p. 82.

8 Quoted in Meeker, pp. 82–83.

9 Plato, *The Timaeus* (written ca. 360 B.C.), in *The Dialogues of Plato,* trans. Benjamin Jowett (New York: Random House, 1937), vol. 2, pp. 14, 16, 17, 18, 21. For a commentary, see Francis MacDonald Cornford, *Plato's Cosmology* (New York: Liberal Arts Press, 1937). On Plato's views on women, see Anne Dickason, "Anatomy and Destiny: The Role of Biology in Plato's Views of Women," *The Philosophical Forum* 5 (1973–74): 45–53.

10 Bernard Silvestris, *De Mundi Universitate* (written ca. 1136), ed. Carl Sigmund Barach and Johann Wrobel (Innsbruck: Wagner, 1876); B. Silvestris, *Cosmographia,* trans. Winthrop Wetherbee (New York: Columbia University Press, 1973), pp. 65–127; George D. Economou, *The Goddess Natura in Medieval Literature* (Cambridge, Mass.: Harvard University Press, 1972), pp. 54, 63.

11 Alain of Lille, *De Planctu Naturae* (written ca. 1202), in Thomas Wright, ed., *The Anglo-Latin Satirical Poets and Epigrammatists* (Wiesbaden: Kraus Reprint, 1964), vol. 2, pp. 441, 467; Economou, pp. 73, 76, 77, 82. English translation: Alain of Lille, *The Complaint of Nature,* trans. Douglas Moffat (New York: Henry Holt, 1908), see esp. pp. 3, 4, 11, 15, 41, 44. "I marvel," then I said, "wherefore certain parts of thy tunic, which should be like the connection of marriage, suffer division in that part of their texture where the fancies of art give the image of man." "Now from what we have touched on previously," she answered, "thou canst deduce what the figured gap and rent mystically show. For since, as we have said before, many men have taken arms against their mother in evil and violence, they thereupon, in fixing between them and her a vast gulf of dissension, lay on me the hands of outrage, and themselves tear apart my garments piece by piece, and, as far as in them lies, force me, stripped of dress, whom they ought to clothe with reverential honor, to come to shame like a harlot. This tunic, then, is made with this rent, since by the unlawful assaults of man alone the garments of my modesty suffer disgrace and division" [p. 41].

12 Aristotle, *Metaphysics* (written ca. 335–322 B.C.), in Richard McKeon, ed., *The Basic Works of Aristotle* (New York: Random House, 1971), p. 755, line 1015^a5; see also *Physics,* in *Basic Works,* p. 237, line 193^a28; pp. 240–41, lines 194^b16–195^a14.

13 Aristotle, *De Generatione Animalium* (written ca. 335–322 B.C.), trans. Arthur Platt (Oxford, England: Clarendon Press, 1910), Bk. I, Chap. 19, lines 729^b13, 730^a1–3. See also lines 739^b21–27, 727^b31,

730ª15, 730ᵇ10–25. For a discussion, see Maryanne Cline Horowitz, "Aristotle and Woman," *Journal of the History of Biology* 9, no. 2 (Fall 1976): 183–213; Joseph Needham, *A History of Embryology* (Cambridge, England: The University Press, 1934); Anthony Preus, "Science and Philosophy in Aristotle's Generation of Animals," *Journal of the History of Biology* 3 (Spring 1970): 1–52. Arthur William Meyer, *The Rise of Embryology* (Stanford, Cal.: Stanford University Press, 1939), Chap. 2, pp. 17–27. Caroline Whitbeck, "Theories of Sex Difference," *The Philosophical Forum* 5 (Fall-Winter 1973–74): 54–80, esp. 55–57.

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15 Elaine Pagels, "What Became of God the Mother? Conflicting Images of God in Early Christianity," *Signs* 2, no. 2 (Winter 1976): 297. See also pp. 293–303 for a discussion of women and gnosticism. The discussion of gnosticism draws on Hans Jonas, *The Gnostic Religion* (Boston: Beacon Press, 1958), Chaps. 2–4, 7, 8, and Kurt Seligmann, *Magic, Supernaturalism, and Religion* (New York: Pantheon Books, 1948), pp. 60–66.

16 Quoted in Seligmann, p. 85. See also p. 80.

17 *Ibid.,* pp. 128–29.

18 The following discussion of gnosticism draws on Walter Pagel and Maryanne Winder, "The Eightness of Adam and Related Gnostic Ideas in the Paracelsian Corpus," *Ambix* 16 (1969): 119–39; Pagel and Winder, "The Higher Elements," pp. 94, 96–97, and Walter Pagel, "Das Rätsel der Acht Mütter im Paracelsischen Corpus," *Sudhoff's Archiv für Geschichte der Medizin* 59 (1975): 254–66.

19 Theophrastus Paracelsus, *Selected Writings,* ed. J. Jacobi (Princeton, N.J.: Princeton University Press, 1951), p. 27. On the gnostic sources of Paracelsus' philosophy, see Walter Pagel, "Paracelsus and the Neoplatonic and Gnostic Tradition," *Ambix* 8 (1960): 125–66; W. Pagel, "Paracelsus, Traditionalism and Medieval Sources," in Lloyd G. Stevenson and Robert D. Multhauf, eds., *Medicine, Science, and Culture* (Baltimore, Md.: Johns Hopkins Press, 1968), pp. 57–75; W. Pagel, *Paracelsus* (New York: Karger, 1958), pp. 204–17. Paracelsus' attitude toward women, however, remains ambiguous; for example, "How can one be an enemy of woman—whatever she may be? The world is peopled with her fruits, and that is why God lets her live so long, however loathsome she may be" (Jacobi, ed., p. 26); "He who contemplates woman should see in her the material womb of man; she is man's world, from which he is born" (*Ibid.*).

20 Ralph Cudworth, *The True Intellectual System of the Universe* (New York: Gould and Newman, 1838; first published 1678), vol. 1, p. 404.

21 Carl G. Jung, *Alchemical Studies* in Herbert Read and others, eds., *Collected Works* (Princeton, N.J.: Princeton University Press, 1953), vol. 13, pp. 211–44; F.S. Taylor, Chap. 11; K. Seligmann, p. 98.

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23 M. Tullius Cicero, *Of the Nature of the Gods,* ed. T. Francklin (London, 1775), Bk. II, Chap. 8, p. 96. See also Chaps. 53, 60.

24 Lucius Seneca, *Physical Science in the Time of Nero; Being a Translation of the Quaestiones Naturales of Seneca,* (written ca. A.D. 65), trans. John Clarke (London: Macmillan, 1910). Quotations in order are taken from Bk. VI, Chap. 16, pp. 244–45; Bk. III, Chap. 15, pp. 126, 127. On the Stoic conception of nature see Eduard Zeller, *The Stoics, Epicureans, and Sceptics* (London: Longmans Green, 1870), pp. 134–94.

25 Translated and quoted in F. M. Cornford, *Plato's Cosmology,* p. 330.

26 Gabriel Harvey, *Pleasant and Pithy Familiar Discourse of the Earthquake in Aprill Last,* quoted in Walter M. Kendrick, "Earth of Flesh, Flesh of Earth: Mother Earth in the *Faerie Queen,*" *Renaissance Quarterly* 27 (1974): 548–53, see p. 544. On the earth's veins and bowels, see Georg Agricola, *De Re Metallica,* 1556, trans. Herbert C. Hoover and Lou H. Hoover (New York: Dover, 1950; first published, 1556); p. 1. See also excerpts of Agricola, *De Ortu et Causis Subterraneorum* (first published 1546), in Kirtley F. Mather, ed., *Source Book in Geology* (New York: McGraw-Hill, 1939), p. 7; Athanasius Kircher, *Mundus Subterraneous* (Amsterdam, 1678) in Mather, ed., pp. 17–19.

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28 Giordano Bruno, *The Expulsion of the Triumphant Beast* (first published 1584), trans, and ed. Arthur D. Imerti (New Brunswick, N. J.: Rutgers University Press, 1964), p. 72.

29 Marco Antonio della Frata et Montalbano, *Pratica Minerale Trattrato* (Bologna, 1678), p. 2; as quoted in Frank Dawson Adams, *The Birth and Development of the Geological Sciences* (New York: Dover, 1938), p. 306.

30 Telesio, in Fallico and Shapiro, p. 309.

31 Aristotle, *Meteorologica* (written, ca. 335–322 B.C.), trans. E. W. Webster, in W. D. Ross, ed., *The Works of Aristotle Translated into English* (Oxford, England: Clarendon Press, 1923), vol. 3, line 339a. See Adams, p. 84; examples cited include Konrad von Megenberg, *Das Buch der Natur* (Augsberg: J. Bämler, 1475); Gregorius Reisch, *Margarita Philosophica* (Strasbourg, 1504); Hieronymus Savonarola, *Compendium Totius Philosophiae tam Naturalis quam Moralis* (Venice, 1542): Giorgio Camillo Maffei, *Scala Naturale* (Venice, 1563); Andreas Baccius, *De Gemmis et Lapidibus Pretiosis* (Frankfurt, 1603); Leonardus Camillus, *Speculum Lapidum* (Venice, 1502), Bk. I.

32 Adams, pp. 84–90, 290, 292; examples cited include Thomas Sherley, *A Philosophical Essay Declaring the Probable Causes Whence Stones Are Produced in the Greater World* (London: 1672), pp. 23–128; M.J.C. Schwiegger, *De Ortu Papidum,* dissertation, University of Wittenburg, 1665; Jerome Cardan, *De Subtilitate* (Nuremberg, 1550); Bernard Palissy, *Discours Admirables de la Nature des Eau et Founteines tant Naturelles qu'Artificelles, des Metaus, des Sels et Salines* (Paris, 1580), pp. 122, 134; John Webster, *Metallographa, or An History of Metals* (London, 1671), p. 70; Robert Boyle, *The Skeptical Chemist* (London: Everyman's Library, 1967), pp. 194, 202; Edward Jorden, *A Discourse of Natural Bathes and Mineral Waters* (London, 1669), p. 51.

33 Adams, pp. 90–94; examples include Agricola, *De Ortu et Causis Subterraneorum;* Giorgio Baglivi, *De Vegetatione Lapidum in Opera Omnia* (London, 1714), p. 497.

34 Paracelsus, ed. Jacobi, p. 25; Pagel, "Das Rätsel der Acht Mütter," p. 255; Paracelsus, in Karl Sudhoff and Wilhelm Mattiessen, eds., *Sämtliche Werke* (Munich: Barth, 1922–33), Abt. I, vol. 13, p. 88.

35 Basil Valentine, "The Fifth Key," from *The Practica, with Twelve Keys, and an Appendix Thereto Concerning the Great Stone of the Ancient Sages,* reprinted in *The Hermetic Museum Restored and Enlarged . . .* (Frankfurt, 1678), trans. Arthur Edward Waite (New York: Samuel Weiser, 1974; first published 1893), vol. I, p. 333.

36 Henry More, "An Antidote Against Atheism" (first published 1653) in *A Collection of Several Philosophical Writings of Dr. Henry More* (London, 1712), p. 65.

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43 Seneca, *Natural Questions,* trans. John Clarke, Bk. V, Chap. 15, pp. 207–8.

44 See Erik Erikson on the conflict of values in the mining regions surrounding the "transition from the agrarian preoccupation with mud, soil, and fertility to the miner's preoccupation with rock, dirt, and the chances of a haul; and beyond this, the mercantile aim of amassing metal and money, shiny and

yet 'dirty' and all subject to a new adventurous and boundless avarice which the church tried to crush with all her might—and at the same time to monoplize." E. Erikson, *Young Man Luther* (New York: Norton, 1958), pp. 53–61. On the revival of mining in the fifteenth century after a long lapse from the fall of Rome through the Middle Ages, see William Barclay Parsons, *Engineers and Engineering in the Renaissance* (Cambridge, Mass: M.I.T. Press, 1968), pp. 177–200.

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51 Quoted in Kendrick, "Earth of Flesh," p. 538. Edmund Spenser, *The Faerie Queen,* ed. John Upton, 2 vols. (London, 1758; first published 1590/5), Bk. II, Canto 7, verse 17. On Spenser's participation in the sixteenth-century debates on mining, his use of Agricola, and the description of Mammon's forge, see Kendrick, pp. 537–41. *Faerie Queen,* vol. 1, Bk. II, Canto VII, verse 15: "At the well-head the purest streames arise;/But mucky filth his braunching armes annoyes,/And with uncomely weedes the gentle wave accloyes." Mammon's forge is described in vol. I, Bk. II, Canto VII, verses 35–36. On Spenser's association of lust with mining see Kendrick, pp. 544–45.

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54 Donne, *Poems,* Elegie XVIII, "Love's Progress," p. 104, lines 27–36, lines 91–94; Elegie XIX, p. 107, lines 25–30.

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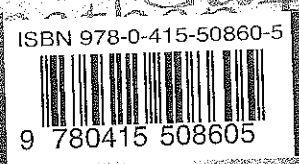
ISBN 978-0-415-50860-5



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