

The Spirituality of the Soil:
The Idea of Teleology from Aristotle to Rudolf Steiner¹

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I have been farming on Lopez Island for nearly half a century, and during thirty of those years I also taught at the university what exponents of Steiner’s works would label spiritual science, but conventionally is understood as humanities, that is, the disciplines that explore the relation of spirit and matter in human experience. As undergraduate student of science, I puzzled over the difference between the living frog and the pitiful, dead cadaver studied in the laboratory. As the devil says of the scientist, in Goethe’s *Faust*, “Wer will was Lebendigs lernen und beschreiben/ Sucht erst den Geist herauszutreiben/ Dann hat er die Teile in der Hand/ Fehlt, leider, nur das geistige Band” (To know some living thing and describe it/ He hastens to drive out its spirit/ Now he holds the parts in his hands/ But, alas, he lacks the spirit band). To find what the poet means by the spirit that binds the material parts of an organism into a living being, I searched in philosophy and science, cultural history and art, poetry, folklore, mythology and religion, and everywhere found the universal idea of an etheric force that gives life and shape to living beings, plants and animals². But I also learned that to understand how spirit and matter are irreducibly intertwined in life, theoretical knowledge was not enough. What was needed was the intuitive knowledge that comes from participatory experience of elemental nature. In short, I needed to get my hand into the living soil and become a farmer, and not just any, but a biodynamic farmer, because in biodynamics the relationship between matter and spirit is made comprehensible both philosophically and in practice.

Over the years, my elder brother, a Biblical scholar and longtime dean of a Lutheran seminary in Stuttgart, Germany, chided me for pagan tendencies whenever I expressed that I had come to experience the presence of spirit as immanent in Earth, Fire, Air and Water. In husbanding soil, plants and animals biodynamically, I have worked with the four classical elements, mindful of Rudolf Steiner's imperative to heal the earth, and of the farmer's mandate as quintessential (fifth) element, to return to the earth the natural balance it lost when agriculture first began. Not long ago, our Lutheran pastor on Lopez Island prepared the congregation for the celebration of God's presence in the

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² An abbreviated list of examples of life force in various tradition contexts might include: OT: “Breath of God” (turning clay into living beings); NT: “Creative Logos (word/form/thought by which all things are made); China: “Ch’i” (natural energy of the universe); Vedic India: “Prana” (“breath,” life sustaining force); Melanesia: “Mana” (impersonal force enlivening nature, including humans and animals); Germanic tribal culture: “Hamingja” (force identified with chieftain); European folklore: “Powers” (life principle(s) imagined as nature beings); Goethe: “Earth Spirit (life force); Emerson: “Oversoul” (transcendental force infusing all life).

communion bread and wine with the following prayer:

O God, you are Breath: send your Spirit on this meal.
O God, you are Bread: feed us with yourself.
O God, you are Wine: warm our hearts and make us one.
O God, you are Fire: transform us with hope.

After the service I asked the pastor whether her invocation of the divine breath, bread, wine and fire echoed the four natural elements by which the pre-Socratics (5th-6th century before Christ) had construed material reality, and which in Aristotle's natural philosophy (4th century) became the building stones from which the divine element of etheric consciousness formed the ordered cosmos from chaos³? The pastor answered, yes, probably so, although she had not thought about it in those specific terms.

Aristotle's concept of the divine as immanent formative force led to his notion of *telos*⁴ by which he meant that any created thing or being manifests an indwelling purpose or potential (*entelechiaia*, from *en telei echein*=to become complete, or actualizing its intended end).⁵ "Movement," according Aristotle, is any work or activity that allows a living thing to realize its inner, divinely intended end. This thought carries over into Aristotle's understanding of economics, which term he coined by combining the word for household (*oikos*) with the verb "to take care of" or "steward" (*nemein*). Aristotle conceived of "natural farming" as taking care of the soil, "as a mother would of her children,"

³ See Philip H. Wicksteed & Francis Cornford, *Aristotle: The Physics* (1934), xvff.

⁴ The modern term "teleology" was coined by German philosopher, Christian von Wolff in 1728 in his work *Philosophia rationalis, sive logica* [Rational Philosophy, or Logic].

⁵ Aristotle, Φυσική ἀκρόασις (*Physics*), III, i, 201a, 10-16: "Διηρημένου δὲ καθ' ἕκαστον γένος τοῦ μὲν ἐντελέχεια, τοῦ δὲ δυνάμει, ἢ τοῦ δυνάμει ὄντος ἐντελέχεια, ἢ τοιοῦτον, κίνησις ἐστίν, § 8. οἶον τοῦ μὲν ἀλλοιωτοῦ, ἢ ἀλλοιωτόν, ἀλλοίωσις, τοῦ δὲ αὐξητοῦ καὶ τοῦ ἀντικειμένου φθιτοῦ (οὐδὲν γὰρ ὄνομα κοινὸν ἐπ' ἀμφοῖν) αὐξήσις καὶ φθίσις, τοῦ δὲ γενητοῦ καὶ φθαρτοῦ γένεσις καὶ φθορά, τοῦ δὲ φορητοῦ φορά" (We have now before us the distinctions in the various classes of being between what is fully real and what is potential. Definition: *The fulfillment of what exists potentially [indwelling end, purpose, or power to become actual— H.S.], insofar as it exists potentially, is motion* — namely, of what is alterable *qua* alterable *alteration*: of what can be increased and its opposite what can be decreased (there is no common name), *increase* and *decrease*: of what can come to be and can pass away, *coming to be* and *passing away*: of what can be carried along: *locomotion*.) Translation: Richard McKeon, *The Basic Works of Aristotle*, 1941, 254.

which he contrasted with “unnatural farming” for money (*krematistika*, from *kremata*=coins).⁶ In other words, for the ancient philosopher, earth was a spiritual thing, and care of the soil a sacred task.⁷

Aristotle's unifying vision of spirit and matter resonated in medieval theology, as did his cosmological treatise, *On the Heavens*, which detailed how the four elements are formed into the perishable bodies of the sublunary sphere by the ether bodies in the planetary sphere whose motions are perfect and eternal. Aristotle's geocentric model of the universe, based on precise observation allowing to predict planetary movement, dominated astronomical thinking for more than 1,800 years, until replaced by Copernicus' heliocentric model in the 1500's. 13th-century theologian, St. Thomas Aquinas, the founder Scholasticism, affirmed Aristotle's concept of motion as teleological development,⁸ and he made great

⁶ Aristotle, *Politics*, I, iii, 1258a, 34 -1258b, 8: “μάλιστα δέ, καθάπερ εἴρηται πρότερον, δεῖ φύσει τοῦτο ὑπάρχειν. Φύσεως γάρ ἐστιν ἔργον τροφήν τῷ γεννηθέντι παρέχειν· παντὶ γάρ, ἐξ οὗ γίνεται, τροφή τὸ λειπόμενόν ἐστι. Διὸ κατὰ φύσιν ἐστὶν ἡ χρηματιστικὴ πᾶσιν ἀπὸ τῶν καρπῶν καὶ τῶν ζώων. § 23. Διπλῆς δ' οὐσῆς αὐτῆς, ὡσπερ εἶπομεν, καὶ τῆς μὲν κατηλικῆς τῆς δ' **οικονομικῆς**, καὶ ταύτης μὲν ἀναγκαίας καὶ ἐπαινουμένης, τῆς δὲ μεταβλητικῆς ψεγομένης δικαίως (1259a) οὐ γὰρ κατὰ φύσιν ἀλλ' ἀπ' ἀλλήλων ἐστίν, εὐλογώτατα μισεῖται ἡ ὀβολοστατικὴ διὰ τὸ ἀπ' αὐτοῦ τοῦ νομίσματος εἶναι τὴν κτήσιν καὶ οὐκ ἐφ' ὅπερ ἐπορίσθη. Μεταβολῆς γὰρ ἐγένετο χάριν, ὃ δὲ τόκος αὐτὸ ποιεῖ πλέον (ὄθεν καὶ τοῦνομα τοῦτ' εἴληφεν· ὅμοια γὰρ τὰ τικτόμενα τοῖς γεννώσιν αὐτὰ ἐστίν, ὃ δὲ τόκος γίνεται νόμισμα ἐκ νομίσματος)· ὥστε καὶ μάλιστα παρὰ φύσιν οὗτος τῶν **χρηματισμῶν** ἐστίν” (But, strictly speaking, as I have already said, the means of life must be provided beforehand by nature; for the business of nature is to furnish food to that which is born, and the food of the offspring is always what remains over of that from which it is produced. Wherefore the art of getting wealth out of fruits and animals is always natural. — There are two sorts of wealth-getting, as I have said; one of them is part of household [stewardship], the other is retail trade: the former necessary and honorable, while that which consists in exchange is justly censured; for it is unnatural, and a mode by which men gain from one another. The most hated sort, and with the greatest reason, is usury, which makes gain out of money itself, and not from the natural object of it. For money was intended to be used in exchange, but not to increase at interest. And this term interest, which means the birth of money from money, is applied to the breeding of money because the offspring resembles the parent. Wherefore of all modes of getting wealth it is the most unnatural.) Translation: Richard McKeon, *The Basic Works of Aristotle*, 1941, 1140-1141.

⁷ For an applied discussion of Aristotelian economics in the context of biodynamics, see my essay, “The Economics of the Small-Scale, Self-Sufficient Farm,” *Stella Natura*, 2013.

⁸ See St. Thomas Aquinas, *Commentary on Aristotle's Physics*, 1963, 136-137. Catholic theologian, Otto Hermann Pesch, commented on Thomas Aquinas' reading of Aristotle as follows (“Gnade und Rechtfertigung am Vorabend der Reformation und bei Luther,” 13. *Ökumenisches Forum*, 2007 [Grace and Justification on the Eve of the Reformation and in Luther, 13. Ecumenical Forum, 2007]: “Thomas hat...das ganze Instrumentarium der Philosophie des alten Griechen Aristoteles zur Verfügung. Er geht davon aus, dass Gott allen Geschöpfen nicht nur die Fähigkeit, die “Potenz”, wie das Aristoteles nennt, zum artgemäßen Tätigsein gegeben hat, sondern darüber hinaus auch die angeborene oder durch Übung zu erwerbende Tätigkeitsvorprägungen, sogenannte *habitus* (“Gehaben”), durch die sie in bestimmter Richtung sicher, spontan, leicht und lustvoll tätig sind (*sponte, facilliter et delectabiliter*) [Thomas has the entire range of philosophical instruments of the ancient Greek, Aristotle, at his disposal. He presupposes that God has endowed all created beings not only with the capacity, the “potential,” as Aristotle calls it, for species-appropriate activity, but beyond that with innate or acquired tendencies, so-called *habitus* (“behaviors”), by which they become active in a particular direction (*sponte, facilliter et delectabiliter*).] (Translation mine).

efforts to reconcile Aristotle's views with the Biblical description of creation. However, Aristotle's pre-Christian vision of divine spirit as immanent in nature was eventually called into question in the doctrine of God as transcendent deity who created material reality *ab initio* (from nothing) and promised to redeem it by grace. In his disputation against scholastic theology, Martin Luther inveighed that "the whole of Aristotle is to theology as shadow is to light," and that "the entire Ethics of Aristotle is the worst enemy of grace."⁹ Furthermore, by the 17th century, Aristotle was rejected by Rationalist philosophers who conceived a new way of knowing the world by focusing their science entirely on material reality to the exclusion of spirit. For Descartes (1596-1650) "movement" no longer was purposeful development but transport of a measurable material particle from a measurable point A to point B, "nothing more than the action by which any body passes from one place to another."¹⁰

By contrast, the Jewish philosopher, Baruch Spinoza (1632-77) vehemently opposed the Rationalist, as well as the Judeo-Christian perspectives, which earned him excommunication from the Synagogue and banning of his writings by the Church. For Spinoza, Spirit and Matter were the same, and God immanent in his Creation, and therefore right study of Nature required focus on *natura naturans* (present active participle of *naturare*) by which Spinoza meant the self-causing activity or process of God's presence emerging in nature, in distinction from *natura naturata* (perfect passive participle), by which he meant the passive product of causal chains originating in God's creation, i.e. emerged quantities, data or things.¹¹

According to 20th century German philosopher, Karl Jaspers, when Spinoza wrote "*Deus sive Natura*" (God or Nature) he meant the god that was *natura naturans* not *natura naturata*, that is, "dynamic nature in action, growing and changing, not a passive or static thing."¹²

In modern times, Spinoza's views on spirit and matter are echoed in various writings of vitalist

⁹ Luther, *97 Theses: Disputation Against Scholastic Theology*, 1517, theses 51 and 42.

¹⁰ Descartes, *Les Principes de la Philosophie* (The Principles of Philosophy), 1644, II, 24: "Le mouvement donc, n'est autre chose que l'action par laquelle un corps pass d'un lieu en un autre." (Translation mine).

¹¹ Spinoza, *Ethica* (Ethics), 1677, I, Propositio (Thesis) XXIX: "Nam ex antecedentibus jam constare existimo, nempe, quod per Naturam naturantem nobis intelligendum est id, quod in se est, & per se concipitur, sive talia substantiae attributa, quae aeternam, & infinitam essentiam expriment, hoc est Deus, quatenus, ut causa libera, consideratur" — ("Because, as I believe, it follows from what has been said before, that by *Natura naturans* we are to understand that which exists in itself and is conceived through itself, or such attributes of the substance which expresses eternal and infinite being, i.e. God, inasmuch as he is regarded as free cause" (transl. mine). — "Per naturatam autem intelligo id omne, quod ex necessitate Dei naturae, sive uniuscujusque Dei attributorum sequitur, hoc est, omnes Dei attributorum modos, quatenus considerantur, ut res, quae in Deo sunt, & quae sine Deo nec esse, nec concipi possunt" — "By *Natura naturata*, however, we understand all that which follows by necessity from God's nature, i.e. all modifications of God's attributes, in as much as they can be regarded as material things, which are in God and without God can neither exist nor be conceptualized." (Translation mine).

¹² Spinoza, *Ethica* (Ethics), 1677, IV, Introduction: "Deus, seu Naturam appellamus" ("God, whom we call Nature." (Translation mine). See Karl Jaspers, *Spinoza*, 1974, 14 and 95.

philosophers such as Teilhard de Chardin (1881-1955), a Jesuit priest, philosopher and paleontologist who understood creative evolution to be a theological process towards union with the Godhead, and interpreted the paleontological record as evidence of the growth of spirit in matter,¹³ or in the work of Hans Driesch (1867-1941), a biologist who on the basis of his embryological studies revived the Aristotelian concept of entelechy,¹⁴ or in the metaphysical musings of physicist, Werner Heisenberg, (1901-76), the author of the uncertainty principle in quantum theory, who argued persuasively that matter and spirit are inseparable from each other.¹⁵

The above are a but handful of examples of how some modern scientists and philosophers echo Aristotle's and Spinoza's thoughts concerning the relation of spirit and matter in nature.

However, from a biodynamic perspective, Spinoza's (and Aristotle's) influence was most profound on Johann Wolfgang von Goethe (1749-1832), whose scientific writings form the foundation of biodynamic philosophy and agricultural practice.

Goethe's approach to the study of nature, upon which Rudolf Steiner's concept of agriculture is based, can be characterized as phenomenological, in contrast to the reductionist approaches exemplified by the work of Descartes, Newton (1642-1727), or Linnaeus (1707-1780) and their followers. In Descartes' view, the physical world is separated from spirit (God, mind), and the universe a mechanical system governed by natural laws that can be described in mathematical terms. In following Descartes, Newton demonstrated the scientific method of reducing complex phenomena by quantitative measurement and mathematical formulas involving the substitution of instruments for the human observer, and relying on controlled experiments to verify hypotheses. Linnaeus, the founder of the binomial system of nomenclature, based his system of plant classification mostly on the number of stamens and pistils in the flower. Modern science and technology are the direct result of this reductionist method, most strikingly illustrated by the new platform tool referred to as nanotechnology which measures and manipulates matter at the scale of 1 billionth of a meter.

¹³ Chardin, *The Phenomenon of Man*, 1955, 308.

¹⁴ Driesch, "The Potency of the First Two Cleavage Cells in Echinoderm Development. Experimental Production of Partial and Double Formations," 1891-1892.

¹⁵ Heisenberg, *Das Naturbild der heutigen Physik* (The Image of Nature in Today's Physics), 1955, 108-109: "Ist also der Geist eine Eigenschaft oder Wirkung des Stoffes im Gehirn, so muß diese Eigenschaft gemäß dem Gesetz von der Erhaltung des Stoffes den von der Mechanistik vorausgesetzten Atomen unter allen Umständen zukommen, und der Stein, der Tisch, die Cigarre sind beseelt, ebenso wie der Baum, das Thier und der Mensch. In der That drängt sich dieser Gedanke, wenn man die Voraussetzung zugiebt, so unwiderstehlich auf, daß man in der neueren philosophischen Literatur ihn entweder als richtig oder doch wenigstens als angemessen empfiehlt, oder aber zu seiner Vermeidung einen entschlossenen und unüberbrückbaren Dualismus zwischen Geist und Materie aufstellt" (If spirit is a property or effect of matter in the brain, then this property must accrue to atoms according to the law of the preservation of matter assumed by mechanistic physics, and the stone, the table, the cigar must be endowed with spirit, as much as trees, animals and humans. Indeed, given the stated assumptions, this thought becomes so irresistible that current philosophers recommend it as correct or at least reasonable, or in order to avoid it, take refuge in a resolute and insurmountable dualism of spirit and matter). (Translation mine).

By contrast, Johann Wolfgang von Goethe, who was a natural philosopher and scientist as well as a poet, argued that the life history or development (ontogenesis) of organisms is not reducible to mechanistic explanation; life processes must be understood in teleological rather than causal terms, and the *telos* or purpose of life force indwelling an organism is best understood in terms of its holistic “form” or “type.” Holistic science must factor in the human observer and therefore is necessarily qualitative rather than reducible to quantitative measurement and mathematical abstraction. Goethe’s scientific method involved sustained observation of phenomena in nature through all of the five senses, but also through intuition and the imagination. Observation intensified through experimental variation would provide the observer with multiple perspectives and gradually lead him to intuit an unifying concept, the “form” or “type” of the organism under study. Ideally the observer through the use of his imagination identifies with the phenomenon studied, instead of objectifying it through mathematical abstraction. Goethe terms this “a delicate empiricism which intimately identifies itself with the object of study and thus becomes the actual theory.”¹⁶ In other words—to return to the example of the frog dissected in the laboratory—to gain real understanding of the frog the observer must intuitively become one with living creature’s essence. Macro-level understanding of the living form rather than micro-level (molecular or sub-molecular) construction is the goal of Goethe’s science, the diametric opposite of the goals and methodology of nanotechnology.

Goethe demonstrated his methodology in important applied studies to develop a theory of color that corrected and amplified Newton’s theory of light¹⁷; he developed a theory of plant metamorphosis that laid the foundation for the study of morphology¹⁸, in contrast to Linneaus’ reductionist model; and he discovered the intermaxillary bone through holistic analysis of human anatomy¹⁹. Long ignored by natural scientists because of his rejection of mathematical abstraction as an adequate tool to understand natural phenomena, Goethe is today recognized as a founder of the science of ecological systems²⁰.

On the biodynamic farm, Goethean science becomes the model for phenomenological understanding of soil quality, plant and animal life, and the countless symbiotic relationships that make up the whole farm organism. If nothing else, Goethe teaches the farmer how to see, hear, smell, feel, taste, and intuit the organic and inorganic life forms upon which the success or failure of the farm system depend.

¹⁶ Goethe, *Maximen und Reflexionen* (Maxims and Reflections), 1963, 68: “Es gibt eine zarte Empirie, die sich mit dem Gegenstand innigst identisch macht und dadurch zur eigentlichen Theorie wird.” (Translation mine). Much like Goethe, 20th century philosopher and scientist, Michael Polanyi, argues that “it is not by looking at things, but by dwelling in them that we understand their joint meaning” (*The Tacit Assumption*, 1983, 18).

¹⁷ *Zur Farbenlehre* [*The Color Theory*], vols. I-III, 1810.

¹⁸ *Versuch die Metamorphose der Pflanzen zu erklären* [An Attempt to Explain the Metamorphosis of Plants], 1790.

¹⁹ Goethe, “Über den Zwischenkiefer des Menschen und der Tiere” (Concerning the Intermaxillary Bone in Humans and Animals), 1784 (1820, 1831).

²⁰ Bortoft, *The Wholeness of Nature: Goethe's Way of Science* (Edinburgh) 1996, passim.

At our farm we teach the Goethean approach to nature through practical example and application, workshops, intern- and apprenticeships, short courses, and other educational programs, lectures and articles.²¹ The Goethean perspective is evident in the work of Alan Chadwick (1909-80), an early student of Rudolf Steiner and biodynamic gardener extraordinaire, whose work led to the establishment of the Center for Agroecology and Sustainable Food Systems at the University of California, Santa Cruz. In one of his many talks to his students, Chadwick said that “behind the whole of our living, behind all plants and all [material] manifestation is a spirit. Invisible... This is the basic attitude and approach of biodynamics: spiritual vision behind everything we do.”²² Chadwick describes the spirit behind material manifestation as an invisible presence that can be experienced in biodynamic practice when gardener or farmer work the soil in “reverence and obedience.” One of the many times the truth of this statement came to me was the time when two fundamentalist preachers approached me in my garden and asked me whether I wanted to “see the kingdom of God,” and I answered, spontaneously, that I was standing in it.

Studying Rudolf Steiner’s seminal *Geisteswissenschaftliche Grundlagen zum Gedeihen der Landwirtschaft* (known in English translation as *Spiritual Foundations for the Renewal of Agriculture* or simply as *The Agriculture Course*), a series of eight lectures Steiner gave toward the end of his life, can indeed be a daunting exercise. In 1924, Steiner responded to requests by farmers in eastern Germany concerned about the falling fertility of chemically farmed soils and declining animal health. In the *Agriculture Course*, which laid the foundations of what became later known as Biodynamics, Steiner explained that continued applications of chemicals in the form of synthetic fertilizers and pesticides had destroyed the soil micro-biological life and that farmers had lost the traditional understanding of what life actually is. Soil is not dirt – soil is the dynamic, spirit-filled basis for life. Soil is a living being. The ways in which humans use soil shape its tilth, health and fertility. Steiner urged farmers to restore humus levels by composts and prescribed biodynamic preparations, and he called for an holistic view of agriculture conceiving of soil, farm, and cosmos as one integrated organism manifesting life force, or spirit.

But the *Agriculture Course* is much more than a clarion call to ecological farming. Steiner (1861-1925), who had studied mathematics, physics and philosophy in Vienna and in 1891 earned a doctorate at the university in Rostock, Germany, with a dissertation on Fichte’s theory of knowledge, between 1888 and 1896, was editor at the Goethe Archives in Weimar and there wrote introductions and commentaries to four volumes of Goethe’s scientific writings, as well as two books on Goethe’s epistemology (1886) and worldview (1897),²³ in which he developed Goethe’s phenomenological approach to the study of nature.

The *Agriculture Course* can be characterized as an exercise in Goethean science, combining

²¹ See www.sshomestead.org/research/publications.

²² Chadwick, *Reverence, Obedience and the Invisible in the Garden*, 2013, 45-51.

²³ Steiner, *Grundlinien einer Erkenntnistheorie der Goetheschen Weltanschauung* (Outline of an Epistemology of Goethe’s world view), 1886 — *Wahrheit und Wissenschaft : Vorspiel einer Philosophie der Freiheit* (Truth and Science: Prologomena to a Philosophy of Freedom), 1891.

observation, qualitative analysis, intuition and imagination to show how the invisible, spiritual law of the cosmos manifests in matter, in the life of soil, plants and animals, and in the rhythms in which the whole farm organism is embedded. As did Aristotle, Steiner posits that elemental matter is shaped by etheric, formative and life-giving forces streaming to earth from the cosmos. The solar system, while objectively heliocentric, subjectively is experienced as geocentric, i.e. the earth is perceived as centered in a rhythm of energy flows. Silica (SiO₂) which science estimates to constitute 60% of the earth's crust (earth element), and which enable plants to have their upright form, convey formative forces from the outer planets, Mars, Jupiter and Saturn; lime and related substances which provide plants with volume, fertility and nutritive power, convey astral forces from the inner planets, the Moon, Venus, and Mercury. The Sun is the source of all energy in our solar system. In physics, energy is defined as the ability to do work or to produce change (from Greek, *en*=in + *ergon* =work), for instance, in the form of heat, light, sound, electricity and chemical energy. Depending on the material context in which solar energy does its work, it is measured in foot-pounds, joules, ergs, or some other unit of measurement. When solar force acts on a body, the work performed is the product of the force; but what is the force in itself? Is it the chemical energy in the form of vitamin D produced by the sun shining on human or animal skin, or the electric energy produced in a photovoltaic panel, or the prismatic colors produced in the human eye looking at an edge between darkness and light, or the sound of the wind produced by differentially heated air masses? All of these are manifestations of solar energy, but the material manifestation of each phenomenon is radically different from the others, and it tells us nothing about what solar energy is aside from the scale of observation and measurement used in each instance. Steiner, as Goethe, Spinoza, Aristotle and others did before him, posits that spirit and matter are the same, seen from different perspectives, one physical, the other metaphysical. Thus the sun is not merely a physical force; it is a spirit vested with formative power and indwelling purpose (*telos*). Likewise nitrogen (fire) is a chemical substance that stimulates plant growth in the soil but, in Steiner's view, it is also seen as the carrier of astral or soul force; oxygen (air) is seen as the carrier of the life principle effectively separating living and dead organisms; carbon (earth) is seen as the element that bears the imprint of the cosmic form principle (idea or form); hydrogen is seen as the force by which form and life are dissipated from the physical in the process of life and death.

The earth, recently referred to by Pope Francis, as our mother and sister²⁴, is envisioned by Steiner as an individual, living organism, the living diaphragm between the earth's core and the surrounding atmosphere open to the spiritual/etheric forces flowing from the cosmos. By fertilizing the soil with compost, a living substance, organic nitrogen is brought into the soil to carry life there, to support the macro- and microorganisms which supply the soil humus enabling plant growth and health. In contrast, chemically farmed soils are typically poor in micro-organic life because synthetic fertilizer does not carry life forces to the earth, but produces lifeless soils and therefore nutrient-poor plants. In the case of plants, etheric silica forces from the sun and outer planets shape leaf growth and flower and seed development in a teleological process described by Goethe as plant metamorphosis, while lime forces from the inner planets (Moon and Mercury) shape and support the development of seeds, and of bunch roots, like legumes, and stem roots, like beets, turnips, or potatoes.

The fermented, herbal preparations Steiner recommended to restore physical health and fertility to agricultural soils damaged by chemical farming, are based on the hypothesis of the same super-

²⁴ Laudato si' mi' Signore" [Praise be to you, my Lord], 2015.

sensible, etheric forces at work through material carriers, a hypothesis that cannot be tested in the laboratory through reductive methods, though its truth can be validated through practical application and observation.

To give an example from our own farm-based research, in 2004-6, we collaborated with Washington State University soil microbiologists and a forage specialist to determine whether pH levels could be raised in our acidic soils in order to improve the availability of soil nutrients to pasture plants. Conventionally, quantities of lime are applied every few years, but in this blind trial randomly selected plots were treated alternately with lime, biodynamic preparations, or no input. Soil and forage samples taken and tested in university laboratories over three seasons demonstrated that the minute inputs (less than a gram/acre) of biodynamic preparations were equally effective in adjusting pH levels as were massive, and expensive, inputs of lime, but the researchers could not explain the effect of the preparations using conventional scientific methods. The report for this field-project was published in a peer-reviewed science journal.²⁵ The same kind of farm-produced, fermented soil stimulants have been applied consistently to our fields for several decades, resulting in five-fold increases in soil organic matter (from 3-15%), a clear indication that the biodynamic preparations are materially effective, even though the quantities applied are minute, at rates of 1 teaspoon to 1/4 cup per acre.²⁶

Another biodynamic practice based on the assumption that subtle super-sensible, cosmic energies can be correlated with the daily and seasonal rhythms of sun, moon, the planets and the star constellations, was developed by a student of Steiner's, Maria Thun, a farmer who over 50 years of field trials developed a calendar for soil preparation, planting and husbanding crops. Rudolf Steiner argued that the forms of all of organic life, including humans, animals, and plants, evolved in response to spiritual energies pulsing from the cosmos. In her work as a farmer in Germany, Maria Thun documented the growth rhythms of plant root, leaf, flower, fruit and seed to make visible the impact of etheric and astral forces in the plants' shape and structure, as well in their protein, fat, carbohydrate and salt content, flavor and keeping quality, resulting in a predictive astronomical calendar that relates quality differences in plants to the temporal plane of cosmic rhythms. Today three such calendars are published annually, two for the northern hemisphere, Maria Thun's prototype in Germany, and Sherry Wildfeuer's *Stella Natura in the U.S.*, and one for the southern hemisphere, by Brian Keats, entitled *Antipodean Astro Calendar*, published in Australia. Interestingly, Keats' calendar includes astronomical charts predicting the schedules when ruminants chew their cuds, showing that animals, too, respond to cosmic rhythms in their daily behaviors, an observation which I have been able to verify in the rumination of cows on my own farm.

Unlike plants, animals and humans directly assimilate air and warmth (fire) through their nerve-sense and respiratory systems, but assimilate the elements of earth and water through their digestive systems. By contrast, plants directly assimilate earth and water and give off air and warmth through the process of respiration. Steiner's concept of nutrition posits that man's true digestive organ is the nerve-sense

²⁵ J. R. Reeve (Utah State U.), L. Carpenter-Boggs (Washington State U.), H. Sehmsdorf (S&S Center for Sustainable Agriculture), "Sustainable Agriculture, a case study of a small Lopez Island farm," *Agricultural Systems*, no. 104 (2011), 572-579.

²⁶ For details on how the preparations are produced and applied, see www.sshomestead.org/offerings/biodynamic.

system located in the brain and throughout the body, with the stomach and intestines in mere support roles. Through the food we place in our stomachs, we internalize the astral and etheric principles vested in gross material substances derived from plant and animal sources. The energies derived from this material food empower the brain and nerve-sense system to receive cosmic principles of form and spirit by way of breath, feeling, thought, intuition and imagination, and by input from our five senses. If the food we put in our stomachs is nutritionally inferior and without life, the nerve-sense system cannot do its work of inner development to guide the spiritual in the human to the spiritual in the universe. The analogy that has helped me understand Steiner's concept of nutrition is that of a radio (representing the nerve-sense system), plugged into a power source (representing the digestive system). If the power source is poor or faulty (as in lifeless food), the radio cannot receive the music streaming in from the ether, and if I turn the radio dial (my five senses), to stations broadcasting trashy contents, the brain will be left without true nourishment for my thoughts, feeling, intuition and creative imagination.

What, then, are the practical consequences of managing the soil, and the whole farm organism, from a spiritual perspective? Can you be a biodynamic farmer without recognizing the spirituality of the soil? Demeter certification of biodynamic farms does not require demonstration of spirituality. How could it? It is not possible to quantify and certify spirit. Nevertheless, the sense that matter is embedded in spirit is of the essence of the biodynamic world view and practice, and biodynamic farming is inherently practical in that it deliberately and systematically makes use of spiritual forces to secure the fertility of the soil and the health of every living thing dependent on the soil, that is, plants, animals, farmers and consumers, and the whole of the farm organism and the ecological and social community in which it is embedded. And finally, as stated before, biodynamic farming practice promotes the inner development of the farmer by guiding (as Steiner put it) "the spiritual in the human being to the spiritual in the universe"²⁷.

This personal progress toward a unifying and transformative apprehension of cosmos and life as spiritual is fundamental to Steiner's thinking and to biodynamic practice. It also informs the writings of numerous modern ecologists from Emerson²⁸ and Thoreau²⁹ to Rachel Carson³⁰, and more recently the

²⁷ Steiner, *Agriculture Course*, 1924, Introduction.

²⁸ Emerson, "On Self-Reliance," *Essays*, 1934, 32: "Prayer is the contemplation of the facts of life from the highest point of view. It is the soliloquy of a beholding and jubilant soul. It is the Spirit of God pronouncing his works good. But prayer as a means to effect private end is meanness and theft. It supposes dualism and not unity in nature and consciousness. As soon as the man is one with God, he will not beg. He will then see prayer in all action. The prayer of the farmer kneeling in his field to weed it, the prayer of the rower kneeling with the stroke of his oar, are true prayers heard throughout nature, though not for cheap ends."

²⁹ Thoreau's *A Week on the Concord and the Merrimack Rivers (1849)* and *Walden (1854)* are infused with the understanding that the divine is immanent in nature.

³⁰ Biologist, Rachel Carson, in *Silent Spring* (1962), couches her analysis of the impacts of man-made radiation and chemicals on human and ecological health in mythopoeic terms when she refers to adenosine triphosphate (ATP) which by means of the mitochondria furnishes energy to muscle and nerve cells as "the universal currency of energy" (203), and in her conclusion urges that we take into account the "life forces" and cautiously seek "to guide them into channels favorable to ourselves" (298).

work of Per Espen Stoknes³¹, John Vaillant³², Fred Kirschenmann³³ and Wendell Berry who speaks of the “spirit (of God) astir in the world.”³⁴

Let me conclude with a particularly moving example of the sense that God is immanent in living nature and in the soil, as it occurs in the work of William Bryant Logan, a soil scientist and ecologist. In his book, *Dirt: The Ecstatic Skin of the Earth* (1995), Logan asks what to make of the Biblical story of the Burning Bush. He refers the reader to the two equations by which all organic life fundamentally exists, one the equation of photosynthesis, the other that of burning. In photosynthesis, the plant rooted in the soil (earth element) makes the food it needs from sunlight (fire element), carbon dioxide (in the air element), and H₂O (water element). In the process of burning (fire), plants and animals unlock the stored solar energy to turn it into biological energy required to fuel all physical and mental processes, thought, feeling and motion. Thus, as Logan puts it, it is a “fundamental fact of nature” that “all that is living burns.” The remarkable thing about the Biblical story of the Burning Bush, Logan observes, is that Moses beheld this natural fact directly, and recognized it as the presence of God speaking to him through Nature. God commands Moses to take off his shoes because the soil he is standing on is holy ground.³⁵ Like the gardener, Alan Chadwick, long after him, Moses beholds the indwelling divine spirit “in reverence and obedience,” and is utterly transformed.

³¹ Stoknes, *What We Are Thinking When We Are Not Thinking About Climate Change*, 2015, 210: “We have forgotten that the air is a sacred, intelligent creative being.”

³² Vaillant, *The Golden Spruce: A True Story of Myth, Madness, and Greed*, 2005, 147: “The Haida refer to the Yakoun (river) as the River of Life, and just as the islands seem to represent the life force in concentrated form, the golden spruce represented the concentrated essence of the Yakoun.”

³³ Kirschenmann, *Cultivating an Ecological Conscience: Essays from a Farmer Philosopher*, 2010, 17: “[I see God] in every thistle in our fields and every calf humping another calf in our pasture...in my theology, the divine always meets us in the flesh — all flesh — all relationships, not just our relationship with humans or relationships we like. This seems to me to be at the heart of the concept of incarnation.”

³⁴ Berry, “The Satisfactions of the Mad Farmer,” *The Mad Farmer Poems*, n.d., 9-11, last stanza: “What I know of spirit is astir/ in the world. The god I have always expected/ to appear at the wood’s edge, beckoning/ I have always expected to be/ a great relisher of this world, it’s good/ grown immortal in his mind.”

³⁵ *Exodus* 1,5.

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