Following the Footsteps of Nature

An account of what Francis Bacon really said about nature, and a refutation of what has been said by those who have misunderstood and disparaged him.

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In recent years it has become fashionable, among 'green' scientists, ecologists and conservationists, to blame pollution, nuclear power, animal experimentation, the misuse of drugs and other damage done to the earth and her inhabitants in the name of scientific advance, on the so-called 'father of modern science', Francis Bacon. In their efforts to find a scapegoat, he has been accused of putting forward "the vision of nature being up for grabs"[1] and seeing "the role of science as being to master and control nature for economic benefit."[2] Above all, he has been accused of presenting a picture of nature devoid of any spiritual dimension, "an automatic machine with no spontaneous life, and no purposes of its own."[3]

The efforts of these scientists to re-establish a spiritual understanding of science and nature, and to rediscover the Earth as a living organism, is a laudable vision of truth; but to accuse Bacon, Descartes, and the Platonic tradition that they upheld, of perpetuating a philosophy of nature without a soul is a gross misconception. There are also those who, whilst upholding Platonism, have accused Bacon of holding opposite views; his words have even been used out of context to support unrelated theories and later re-quoted by others without reference to Bacon's own works.[4] Bacon, himself, was dedicated to finding true knowledge, and it is just this overhasty abstraction from the facts that he was writing about in his introduction to his Great Instauration: "The primary notions of things which the mind readily and passively imbibes....are false, confused and over-hastily abstracted from the facts..., whence it follows that the entire fabric of human reason which we employ in the inquisition of nature is badly put together and built up, and like some magnificent structure without any foundation."[5] It is my intention, in this paper, to present some of Bacon's ideas in their true context, and to show that, in following the Platonic tradition, he believed just as much in the unity of body, mind and spirit as the most enlightened of modern ecologists.

Rupert Sheldrake, in a paper taken from his talk at a conference organized by the Centre for Creation Spirituality in 1991, associates Bacon with the Protestant Reformation which sought to suppress paganism and thus desacralize the natural world. In fact, as Basil Willey so clearly describes in a chapter on 'Bacon and the Rehabilitation of Nature',[6] it was medieval scholasticism that had much earlier rejected nature as pagan and satanic, and it was Bacon who proposed a transference of interest from the abstract speculation of the schoolmen to the observation of nature at first hand. He did not reject metaphysical truths but sought only to free them from theological pedantry.

Other critics have argued that Bacon's so-called materialistic approach to science resulted from the decline of these religious beliefs of the Middle Ages in the late 16th and early 17th centuries, and that it was the introduction of Neo-Platonism from Renaissance Italy which enabled him, and other philosophers such as Descartes, to separate mind from body and affirm "the division of science from the spiritual."[7] But Bacon's intentions were never to exclude God from science or nature. Study of the Divine and the study of Nature, he

believed, should be kept apart: the logical arguments of scholastic debate, based on Scriptural knowledge of God and the angels, cannot be used to understand our natural world. "To Bacon," says Basil Willey, "the logic-spinning of the schoolmen was a kind of forbidden knowledge; it was a presumptuous attempt to read the secret purposes of God, and to force his works into conformity with the laws of the human mind."[8] On the other hand, although Bacon warns against reason becoming clouded in the early stages through wonder—this he calls "broken knowledge"[9]—it is possible that, through "inquisition" or enquiry of nature, freed from religious dogma, we may come to understand God. To illuminate his teaching, he describes the "golden chain" of Neo-Platonism[10] that stretches between heaven and earth: "When the mind goes deeper, and sees the dependence of causes and the works of Providence, it will easily perceive, according to the mythology of the poets, that the upper link of Nature's chain is fastened to Jupiter's throne."[11] We should not, he concludes, attempt to "submit the mysteries of God to our reason," but to raise "our reason to the divine truth".[12]

A particular bone of contention is Bacon's apparent cruel and calculated approach to scientific research. Not only has exception been taken to his use of 'inquisition' but also to what is for us, today, his apparently emotive imagery of nature being hounded[13] and driven, then constrained, bound and tortured into working—according to the self-perpetuating arguments of his critics—for the self-interest of the human race. Carolyn Merchant, in *The Death of Nature* (1980), in arguing a case against Bacon for the eco-feminist movement, tries to prove a relationship between his attitude to scientific research and the inquisition and torture of witches.[14]

We have only to return to the works of Bacon himself and the source of this imagery may be found. In *The Wisdom of the Ancients* he interprets myths from the Greeks in the light of his own philosophy of Hermetic-Christian-Platonism. The story of Proteus tells of an old herdsman, a prophet who understood past, present and future. Those who came to consult him in his cave were obliged to bind him fast with manacles and fetters; at which, endeavouring to free himself, he would change from the shape of one wild beast to another, or into other natural forms such as fire or water. At length he would resume his natural shape. Bacon explains Proteus as denoting matter, "the oldest of all things after God himself".[15] When force is applied to matter to "torture and vex it," it will transform itself into "a strange variety of shapes and appearances," as, for instance, the blows from a hammer applied to red-hot metal can beat it into many forms, from farm implements to the machinery of war. Eventually it will return to its unfettered state of chaos or matter without form, although it can never, like Proteus, be entirely destroyed by human hands: "nothing but the power of the Creator can annihilate or truly destroy it".[16] Knowing this, and having knowledge of all its potential, its properties, changes and processes, matter, like Proteus, understands past, present and future. Therefore this torture and vexation is merely Bacon's colourful mode of expression; it is not cruelty to living creatures in the name of scientific advance, as Bacon's critics would have it; but the forming of matter, from the original pot to hold water to the myriad of forms that we have for our use in the modern world. Not all for the good of the world, it is true, but that is not Bacon's fault!

Contrary to the impression given by a superficial reading of Bacon, he views man not as the torturer of nature but rather as her gardener, and the forming, or cultivation, of nature as an art that both serves and enhances her: "the passages and variations of nature cannot

appear so fully in the liberty of nature, as in the trials and vexations of art".[17] Shakespeare, in finer and gentler words, expresses the same idea in Polixenes' argument in *A Winter's Tale* that "art itself is nature":–

> Yet Nature is made better by no mean
> But Nature makes that mean; so over that art
> Which you say adds to Nature is an art
> That Nature makes. You see, sweet maid, we marry
> A gentler scion to the wildest stock,
> And make conceive a bark of baser kind
> By bud of nobler race. This is an art
> Which does mend Nature - change it, rather - but
> The art itself is Nature.[18]

Shakespeare uses "marry" where Bacon would "bind" his graft to the tree, and prefers to "mend Nature" rather than "vex"—but the meaning is the same.

Nature has been discussed so far in the terms of Proteus or matter, the "body of the world" as it is called in the Platonic tradition, but this is only part of Nature itself. Nature, that Bacon calls "the universal nature of things", is personified in the figure of Pan. As with the myth of Proteus, Bacon tells the story—or, in this case, many stories—of the god and gives his interpretation. Pan, or the universal nature of all things, was born from the Divine Word of God and the original Chaos, or confused matter—an idea of the creation of the world that is both Christian and Platonic. Pan, writes Bacon, is the messenger of the gods, next after Mercury, who is the Word of God. This, he explains, is because "the image of the world is the herald of the Divine power and wisdom according to the expression of the psalmist, 'The heavens declare the glory of God, and the firmament showeth his handiwork'".[19]

Pan is given horns because nature is forever surging heavenward so as to unite with the Divine. Pyramid-shaped, the wide base of the horn represents an infinity of different forms which, collected into species, narrow into fewer and fewer "kinds" until a point is reached where there is only One and that is the Divine. "A short ready passage," says Bacon, "from metaphysics to natural theology".[20] As Nature or the Creation flows from God so it returns to God—the "golden chain" between heaven and earth.

The means by which this flow of creation takes place is love. Ficino, the leading philosopher of the Florentine Renaissance, whose form of Hermetic-Christian-Platonism would have been well known to Bacon, describes the creation of, first, the Angelic Mind, then the World Soul and, finally, the Body of the World. It is in love that Chaos first turns to God and Mind is created; from a second chaos, the Soul turns to both God and the Angelic Mind and the World Soul is born; in the same way the Body of the World, originally in formless chaos, "because of a love innate in itself, it directed itself toward the Soul and offered itself obedient to it, and through this conciliating love, receiving from the Soul the ornament of all the Forms which are seen in the world, from a chaos became a world".[21] It is through love that the world is created and it is through love that it is held in its many forms.

Bacon describes the importance of love, in both forming and holding the form of the world, in another of the stories of Pan, who challenges Cupid to a wrestling match which Pan loses. Repeating his description in the myth of Proteus, of how, eventually, matter always returns

to its unfettered state, he says that it "has an appetite and tendency to a dissolution of the world and falling back to its first chaos again, unless this depravity and inclination were restrained and subdued by a more powerful concord and agreement of things, properly expressed by Love or Cupid".[22] In other words, the force that must "bind, vex and torture" nature is that of love—the "art" that tends and forms nature for its own good.

Love also has the power of harmony, through which, in the Platonic teaching, heaven and earth are brought together in unity. If heavenly harmony, symbolised by the movement of the planets—the 'music of the spheres' often referred to by the poets of the Renaissance—can be reflected on earth, the Divine may be manifest. Harmony comes through order, not chaos which is a state of "depravity," and it is the duty of the human race, as the gardeners of nature, to bring it to order in harmonic forms. Symbolising earthly harmony, Pan is depicted holding a pipe of seven reeds, representing the seven planets known to the Jacobeans. The myth tells how, proud of his playing, he challenges Apollo, the god of music and symbol of heavenly harmony, to a musical contest: he loses and Apollo rewards him with asses' ears. Bacon refers to the two harmonies, of heaven and earth, as Divine Providence and human reason. Pan's challenge to Apollo was unreasonable—earthly harmony cannot better the heavenly, it can only try to emulate it: his challenge to Divine Providence, being unreasonable, was rewarded with the asses' ears of ignorance!

Although creation itself is maintained by the love of God, it is the work of mankind to tame the nature of the world as he should his own nature—such is the essence of civilisation—and to bring it to order in harmonic forms. This art of harmonising nature, the "art" that "itself is nature," can only properly be performed by following its own innate laws, in that matter itself knows, according to the myth of Proteus, "the properties, the changes and the processes of nature, and understands the effects and sum of what it does, has done or can do".[23] Science, in its true sense of knowledge or knowledge through study, is the discovery of these laws of nature, and the art of science is the formulation of that knowledge into forms that are both practical and beautiful. In this act of creation, man is thus emulating the Divine. However, before we can practise this art, we have first to discover the laws of nature and harmony, and this is done, Bacon tells us, by following "the footsteps of nature". Through the study and observation of nature, we can trace her back to her root causes—to the laws by which she is held and operates in creation, a "springhead," he argues, which "seemeth to me not to have been visited; being of so excellent use, both for the disclosing of nature and the abridgment of art".[24]

Bacon writes that "The chief business of the Persian magic was to watch the correspondences between the architecture and fabrics of things natural and things civil... Neither are these similitudes, but plainly the footsteps of nature treading or printing upon different subjects or matters... a thing of excellent use for displaying the unity of nature".[25] Following the "footsteps of nature" enables us to discover the harmony of its laws—the golden mean of geometric proportion, for instance, in the shell of a snail. By reflecting these laws of natural harmonic proportion in the building of cities and the creation of gardens or any other of the myriad of forms available to mankind, the harmony of heaven is reflected on earth and unity with the Divine may be experienced.

'Following the Footsteps of Nature'
Emblem from Michael Maier's *Atlanta fugiens*, published in Oppenheim in 1617.

In writing of the importance of the enquiring mind, Bacon quotes from *Proverbs* 20.27: "The spirit of man is as the lamp of God, wherewith he searcheth the inwardness of all secrets".[26] He was not writing in isolation: similar ideas were being exchanged throughout Europe, and his images of a lamp and following nature's footsteps was also used by Michael Maier, whose book of emblems accompanied by philosophical commentaries, *Atalanta fugiens*, was published in Oppenheim in 1617. It included one depicting a philosopher holding up a lantern as he follows the "footsteps of nature".

Like this philosopher holding up the lantern, symbolising the light of knowledge, Bacon advocates that, in the study of nature, we should look under our noses and observe what is in front of us; not like another philosopher who: "while he gazed upwards to the stars fell into the water; for if he had looked down he might have seen the stars in the water, but looking aloft, he could not see the water in the stars".[27] [See illustration on p.6.] Quoting Aristotle, "that the nature of everything is best seen in his smallest portions," he gives as an example the discovery of magnetism: "So we see how that secret of nature, of the turning of iron, touched with the loadstone towards the north, was found out in needles of iron, not in bars of iron".[28]

Also, in following the footsteps of nature, Bacon tells us that we should be vigilant for, while following one set of tracks, we may accidentally stumble on the unexpected. Recounting the fable of how Pan, when out hunting, discovered the lost Ceres when all the other gods had failed to find her, he explains how this shows we cannot discover those things useful to common life, such as corn, through abstract philosophy, but only through the knowledge and experience of nature, "which is often found, even by accident, to stumble upon such discoveries whilst the pursuit was directed another way".[29] This, surely, is true of scientific research today: how many discoveries are made by chance when another line of investigation is being pursued? In this story, too, is found the source of the hunting

imagery—the hunting, hounding and pursuit of nature so disliked by Bacon's critics. In the following passage, it can now be understood that his terminology of "hounding" nature is not in the sense of hunting some terrified creature and tearing her to pieces or, in Merchant's interpretation of Maier's 'Footsteps of Nature' emblem, in prodding her with a staff and probing her with a lantern![30] It is in the careful observation of all her vagaries:–

> From the wonder of nature is the nearest intelligence and passage towards the wonder of art: for it is no more, but by following and, as it were, hounding nature in her wanderings, to be able to lead her to the same place again.[31]

Frontispiece from the German version of Francis Bacon's *De Sapientia veterum* ('Wisdom of the Ancients'), published in Nürnburg, 1654.

Both McIntosh and Merchant accuse Bacon of drawing on "metaphors of repressed sexuality and of torture, as used in the inquisition of the witches of his time".[32] Merchant quotes the following to support her argument: "Neither ought a man to make a scruple of entering and penetrating into these holes and corners, when the inquisition of truth is his whole object—as your majesty has shown in your own example (sic—i.e. witchcraft inquisition)". What they fail to understand is that it is not the extracting of knowledge by torture or the punishment of witches that interests him but the knowledge itself. In the pursuit of truth he wishes to enquire into "superstitious narratives of sorceries, witchcrafts, charms, dreams, divinations and the like";[33] they are all a part of nature and should not be excluded from investigation. Naturally, Bacon is being careful when addressing King James

with his declared views on the subject of witchcraft, but he wishes to make the point that we should look beyond the physical forms and hastens to vindicate himself by pointing out that James himself had written on the subject in the "inquisition of truth". 'Inquisition' is used here, as it is in the earlier quotations, in the sense of questioning and enquiry into root causes, and has nothing whatsoever to do with the eco-feminist argument that Bacon is relating the inquisition and torturing of witches to an explanation of how "inductive scientific method is the same by which the repeatable experimental situation can be achieved and exploited!"[34]

Bacon's imagery and terminology may seem harsh to us today as we strive for more understanding and awareness of nature and the world in which we live, but I hope that by presenting his ideas, that over recent years have become so controversial, in the context in which they were written, I have helped to restore the respect that is his due. As 'the father of modern science', Bacon wished to restore the Divine to the study of science and reconcile it with religion; in Basil Willey's words, he gave "a first impulse towards scientific deism."[35] It is extraordinary how Bacon's words can now be distorted and a Schumacher Memorial lecturer declare: "Francis Bacon affirmed the division of science from the spiritual!"[36]

It is to be hoped that scientists wishing to reinstate a spiritual understanding of nature will realise that Bacon's views, far from being in opposition to theirs, are in fact their own, and will in future accept him as their 'father of modern science'. To give Bacon the last word: "If it be truth, the voice of nature will consent, whether the voice of man do or no!"

Endnotes

[1] Rupert Sheldrake, 'The Rebirth of Nature,' *Caduceus,* Winter 1991, p.20.

[2] Alistair McIntosh, *The Emperor has no Clothes – Let us Paint our Loincloths Rainbow: A Socio-Environmental Critique of British Science Policy*, unpubl. paper for the Centre for Human Ecology, 1993, p.5.

[3] Rupert Sheldrake, 'The Rebirth of Nature,' *Caduceus,* Winter 1991, p.20.

[4] Much of McIntosh's criticism of Bacon is taken from Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, London, 1980.

[5] Francis Bacon, *Prooemium,* in *Works*, ed. James Spedding, London, 1857-74, Vol.4, p.7.

[6] Basil Willey, *The Seventeenth-Century Background*, London, 1934.

[7] James Goldsmith, *The Schumacher Memorial Lecture: Measurement or Understanding,* publ. in *Resurgence*, No.156.

[8] Basil Willey, *The Seventeenth-Century Background*, London, 1934, p.39.

[9] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.133.

[10] See Macrobius, *Commentary on the Dream of Scipio,* transl. William H. Stahl, New York, 1952, p.145.

[11] Francis Bacon, *De Augmentis,* ed. Bohn, pp.31-2. See also *Advancement of Learning,* p.188.

[12] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.188.

[13] *Ibid.* p.176.

[14] See note 4.

[15] Francis Bacon, 'Proteus, or Matter,' in *The Wisdom of the Ancients,* p.293.

[16] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.293.

[17] *Ibid.* p.177.

[18] Shakespeare, *The Winter's Tale,* IV, iv, 89-97.

[19] *Ibid.* p.283. Bacon is quoting *Psalm* xix, 1.

[20] *Ibid.* p.281.

[21] Marsilio Ficino, *Commentary on Plato's Symposium on Love*, transl. Sears Jayne, Texas 1985.

[22] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.283.

[23] *Ibid.* p.294.

[24] *Ibid.* p.188.

[25] Bacon, *De Augmentis,* 111.1.

[26] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.132.

[27] *Ibid.* p.177.

[28] *Ibid.* p.177.

[29] *Ibid.* p.284.

[30] Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, London, 1980, p.110.

[31] Francis Bacon, *The Advancement of Learning*, in *The Essays of Lord Bacon including his Moral and Historical Works,* publ. Frederick Warne, London, 1883, p.176.

[32]Alistair McIntosh, *The Emperor has no Clothes – Let us Paint our Loincloths Rainbow: A Socio-Environmental Critique of British Science Policy*, unpubl. paper for the Centre for Human Ecology, 1993, p.5.

[33] Francis Bacon, *De Augmentis,* p.296.

[34]Alistair McIntosh, *The Emperor has no Clothes – Let us Paint our Loincloths Rainbow: A Socio-Environmental Critique of British Science Policy*, unpubl. paper for the Centre for Human Ecology, 1993, p.5.

[35] Basil Willey, *The Seventeenth-Century Background*, London, 1934, p.39.

[36] James Goldsmith, *The Schumacher Memorial Lecture: Measurement or Understanding,* publ. in *Resurgence*, No.156, p.5.