

From Scientific Imagination to Ethical Insight:
The Necessity of Personal Experience in Moral Agency¹

Arthur Zajonc

Department of Physics

Amherst College

I am not a professional philosopher or ethicist, and so will approach the subject of social justice both through my experience with the sciences, but also as a teacher interested in exploring the relationship between science, the humanities and the contemplative traditions.

From my work in physics, I have come to appreciate the several factors that are part of scientific progress. While experimentation and mathematical analysis are key components of my discipline, the use of these alone would only result in a sterile method of inquiry. Every scientific insight or discovery must also make use of highly synthetic and creative faculties called variously imagination or intuition or insight. While much cannot be carried over from science to the area of social justice, I believe that considerations concerning these creative faculties are transferable to the domain of ethics. In particular, while appreciating the roles of biology and society in the formation and support of our life of values, I will argue that these are not the ultimate source of values.

¹ Given originally as a lecture at the Yale University Interdisciplinary Center for Bioethics

Rather, true moral agency is enabled through moral imagination and compassion, and is actualized in stages following the direct experience of moral insight.

I would like to begin with a the story of a beguine or lay religious woman by the name of Marguerite Porete who lived around 1300 in what is now Belgium. Little is know about her aside from her book *Mirror of Simple Annihilated Souls* and the trouble it caused her.² The book is a kind of spiritual love story told in several voices primary among them the voices of the Soul, Love, and Reason. Porete's book opens with the story of a noble and gracious princess who hears of the great courtesy and generosity of a far-off king, Alexander. Without every meeting him, the princess forms a deep and abiding love for the distant king which endures all trials. It is, in the tradition of the troubadours, a true *amour de loin*, or "love from afar." Marguerite Porete's beloved was, of course, no earthly king but her God. The intensity of her love for this distant universal king would get her in deep trouble with Church authorities. How, you might ask, could the devout love of God in 14th century Europe land a well-behaved woman in profound difficulties? The answer concerns the ultimate source of moral authority or agency, and whether a devout lay woman could have direct access to that source of morality without the mediation of the Church.

Let me quote a few passages from the *Mirror of Simple Annihilated Souls* so you can gain a sense for Porete's (and the Church's) dilemma. Remember that this is an **interior** conversation between the Soul, Love and Reason, with Porete, of course, writing

² On Porete see, *Medieval Writings on Female Spirituality*, (New York: Penguin, 2002), p.120ff.

all three parts. After speaking of the spiritual attributes of her divine lover – God – Porete opens with an exchange between the Soul and Love.

“Such is the beloved of our souls, says the Soul.” / “Through such love, says Love himself, the Soul may say to the Virtues, ‘I take leave of you’ – and the Soul has been a servant to those Virtues for many a day.” / “I agree, Lady Love, says the Soul, that is how it was then; but now it is like this; your courtesy has removed me from their dominion. Therefore I say; Virtues, I take leave of you for evermore. Now my heart will be freer and more at peace than it has been.”

Porete’s soul had been, we learn, a servant to the Virtues for many years, but now everything has changed and the Virtues are set aside in favor of a direct relationship to Love.

“Well, Love, say Reason, when was she a servant?” / When she dwelt in Love and was under obedience to you and to the other Virtues, says Love. The souls that are of this kind have dwelt so long in Love and under obedience to the Virtues that they have become free.”

Porete saw herself as having begun under obedience to the Virtues in what she termed “Holy Church of the Little,” which was governed by Reason, but she had graduated to Holy Church the Great in which Love’s favored servants (the annihilated souls of the

book's title) worshiped. In moving from the Church of the Little to the Church of the Great she had become free. If Porete considered herself as free of the Virtues (the precepts and power of institutionalized religion) and no longer under Reason's authority, what would guide her? Here Porete has Reason provide the answer, paraphrasing St. Augustine saying, "Love, Love, and do what you will." One's love for Love itself was to guide Porete's life. She was a lover and her beloved – who was Love – would guide her speech and actions.

Porete's book was sufficiently heterodox to cause its denunciation by certain bishops. In 1308 Porete was arrested by the Dominican Inquisitor William of Paris, confessor to the King of France. Marguerite would neither defend herself nor retract her teachings, simply refusing to respond to her interrogators. She remained in prison and was ultimately convicted for what would become a few years later the official heresy termed: "The Heresy of the Free Spirit," so-named after the passage from St Paul's second letter to the Corinthians, 2 Cor 3:17 "where the spirit of the Lord is, there is liberty." So it came to pass in 1310, that Marguerite Porete was condemned as a relapsed heretic and was sentenced to death in the Place de Grève, the first heretic to be burned at the stake in the Paris Inquisition. The crowds, it was reported, wept upon seeing the noble bearing she maintained as she was led to the pile of faggots and there set ablaze.

My point in telling this story is that already in 1300 Marguerite Porete, at least, understood that the source of moral authority and agency did not ultimately reside with either civil or religious institutions. (This is a point of which Thoreau, Gandhi, and Martin Luther King in his "Letter from the Birmingham Jail" remind us.) Instead, Porete

maintained that the free individual could seek and find moral inspiration through a personal (loving) relationship to a higher spiritual authority or source – which she called Love. While her's is the language of the 14th century, the issues she raises are perennial, and in my view, they have never been more pressing than today when we are called upon to assess the powers of political and legal institutions to make war. Where is the true source of moral authority? On what faculty do we rely for moral judgment? What moral voice do we obey? How do we know to trust it?

In Kohlberg's Theory of Moral Stages, Marguerite is far beyond the "Level II Conventional stages" of morality, in which one's moral values require one to maintain the conventional order as prescribed by moral authorities outside oneself. Indeed Porete certainly qualifies for Kohlberg's highest Level III Post-conventional, stage 6, in which all moral authority is derived from personal moral judgments guided by conscience and an appreciation for universality. Her personal evaluation of her moral conduct superseded all comparable evaluations by juridical or ecclesiastical bodies no matter how learned or powerful. Unfortunately she was centuries ahead of her time, which was collectively committed to an ethics based on Kohlberg Level II Conventions.

And here we come to the nub of the question. What did Marguerite Porete *experience* that trumped all outer conventional institutions of moral authority such that she was willing to burn at the stake for her convictions? Her's was no dry abstract ethical stance born of a utilitarian calculus; neither were the moral positions of M.L. King, Gandhi, or Thoreau born of such a calculus. No, something powerful moves into the

human heart when one love's Love, to use Marguerite and Augustine's expression. But is there any reason at all to heed the call of Love?

Science -- the central role of insight

In attempting to understand the ultimate foundations of ethics and what to make of Marguerite Porete's moral stance, I would like to turn to science and ask concerning its methods, goals, and the standing of its insights. How does science achieve its insights? While reasoning concerning facts plays a role, it is clear that brute empiricism alone is not enough, nor can one simply reason one's way to original insight. Science is not a mere collection or assemblage of facts. Indeed, early science may well display something of this character, in which a group such as the newly founded Royal Society appears to be occupied chiefly with the recording of curiosities and interesting natural phenomena, but the scientific poverty of such an approach is quickly apparent. Likewise reason alone can only elaborate what it already knows; it is at root tautologous.

In the so-called context of discovery, a third form of reasoning must be added to induction and deduction, which Charles Peirce termed abduction, and which David Bohm termed Insight, or which Coleridge termed Imagination, primary and secondary. In his *Biographia Literaria* Coleridge calls primary imagination "...the living Power and prime Agent of all human Perception, and as a repetition in the finite mind of the eternal act of creation in the infinite I AM." This is the flash of knowing by which human beings gain a sudden understanding of circumstances, situations, society or nature. Coleridge believed this knowing to be a reflection of God's own creative process. He goes on to

describe secondary imagination as the same in “kind of its agency” with relation to primary imagination but differing only, “in degree and in the mode of its operation.” While also reflective of God’s creative process, those in artistic fields utilize or experience secondary Imagination often. Coleridge claims of secondary Imagination that “It dissolves, diffuses, dissipates, in order to re-create...it struggles to idealize and unify” Are these not also the faculties on which scientists draw in their creative moments? Einstein famously said,³

Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world. For while knowledge defines what we currently know and understand, imagination points to all we might yet discover and create.

I would hold that the “new” enters science by the door of imagination. It may be validated or falsified by ratiocination or experimental results, but it first appears to Insight-Imagination.⁴

What is science seeking? Early science subscribed to a mechanical and materialistic philosophy, which persists even today especially in the life sciences. All phenomena were to be reduced to the mechanical causal account of objects conceived in terms of enduring primary qualities such as extension, mass, velocity, position, etc. Such accounts have long been considered “explanatory,” and it was such accounts that

³ Albert Einstein, “What Life Means to Einstein: An Interview by George Sylvester Viereck, *The Saturday Evening Post*, 1929.

⁴ See also Douglas Sloan’s, *Insight-Imagination: The Emancipation of Thought and the Modern World* (Westport, CT: Greenwood Press, 1983).

scientists of that era sought. Since the 17th century, pride of place has been given to mechanism, and something has been considered explained when the mechanism by which the effect is brought about has been sufficiently described. This is what Aristotle termed efficient cause. In 1884 Lord Kelvin famously declared that “I never satisfy myself until I can make a mechanical model of a thing.” Bernard de Fontenelle, secretary to the French Academy of Science, wrote in 1686 in his *Plurality of Worlds* that nature is like the grand spectacle at the opera. Most viewers are concerned only with the drama, but “he who would see nature as she truly is, must stand behind the scenes.” Or as Helmholtz put it in 1853, the true natural philosopher “tries to discover the levers, the chords, and the pulleys which work behind and shift the scenes.”

By contrast modern science is less concerned with mechanistic accounts (which often prove of limited utility) and seeks instead the formal regularities and patterns that nature displays, often seeking purely mathematical accounts of a phenomenal domain. The great symmetry principles of physics come to mind: charge conjugation, parity, time reversal invariance. Noether’s theorem which relates spatial isotropy and homogeneity to the conservation laws of angular momentum and energy respectively. Or the principle of least action from which so many of the laws of physics can be derived including the Euler-Lagrange equations of dynamics and the path integral formulation of quantum mechanics of Richard Feynman. Or I think of Einstein’s principle of special relativity which declares that all the laws of physics are identical no matter what the uniform motion of the observer may be. Such principles take precedence over material properties (including the primary qualities of extension, temporal interval, and dynamic quantities

of force and mass) and thus also even over mechanism. Our very concepts of space, time, and simultaneity must give as a consequence of the principle of relativity.

Notice that there is nothing of mechanism about these laws. Hendrik Lorentz complained that Einstein took the principle of relativity as a postulate, while he (Lorentz) had labored long and hard (and unsuccessfully) to find the physical basis for the so-called Lorentz contraction, which is described formally by the mathematical transformations that bear Lorentz's name. No mechanical account exists for length contraction and time dilation (moving clocks slowing down), rather our very conception of space and time is changed fundamentally. Modern physics is really based **not** on mechanism but on *principles* or *formal* causes such as those listed above. In considering Aristotle's four causes, today's physics has largely abandoned the search for efficient causes so dear to the 19th century in favor of formal mathematical understanding.

As a consequence the worldview of philosophically-minded physicists (and there are not so many) changed considerably during the 20th century. Anton Zeilinger, the Schroedinger Professor in Vienna puts it this way.⁵

“...one may be tempted to assume that whenever we ask questions of nature, of the world there outside, there is reality existing independently of what can be said about it. We will now claim that such a position is void of any meaning. It is obvious that any property or feature of reality out there can only be based on information we receive. There cannot be

⁵ Anton Zeilinger, *Science and Ultimate Reality* (Cambridge: Cambridge University Press, 2004), edited by John D. Barrow, Paul C. W. Davies, Charles L. Harper Jr., pp. 218-219.

any statement whatsoever about the world or about reality that is not based on such information. It therefore follows that the concept of a reality without at least the ability in principle to make statements about it to obtain information about its features is devoid of any possibility of confirmation or proof. This implies that the distinction between information, that is knowledge, and reality is devoid of any meaning.”

That is, modern physics demands that we turn sharply away from an ontology of conventional matter and mechanism and turn towards an ontology of information. Knowledge and reality, in this view, arise together. Moreover it is a knowing that is constituted through relationship. There is no meaning to knowing in physics separate from an observer, real or imagined, no “true” state of affairs accessible only to a privileged observer. That is, there is no view from nowhere. Reality is always **relational**, as relativity and quantum mechanics demonstrate.

As an aside I remark, molecular biology remains infatuated with mechanism but will, I believe at some point, make the transition to formal analysis once mechanism proves truly elusive. They have yet to go through the equivalent of the quantum and relativity revolutions of physics.

The Question of Moral Agency

I have belabored physics, its history and philosophy, because I hope to learn what it can teach us concerning how to proceed with morals. Certainly many things will not carry over, but I would like to suggest that some central features will.

First, we need to consider the efforts by evolutionary biologists to seek a material and mechanistic account for ethics. E.O. Wilson and Richard Dawkins are the best known spokesmen for this view, but their number is legion. From the experience of physics, we should be cautious about such accounts. They have proven of limited validity and offer, in my view, no fundamental account. That social behavior is allowed for and supported by our biology is obviously required if we humans are going to display it. The biological capacity for social or even altruistic behavior is totally different from its intentional display. That is surely evident from the lack of altruism we often witness. Biology here is NOT causal, not deterministic, it does not work to a given end (which would falsely bring back final causes into biology). That I can write with a pen is enabled by the biology of my hand. But my hand did not cause writing in any meaningful sense. Likewise, my biology must of necessity be consistent with and supportive of moral conduct, but what is necessary for morality is not sufficient.

Are values merely social constructs? Marguerite Porete did not experience the Virtues that way. Yes, for a parishioner in the Church of the Little, the precepts of the faith community are supported and even enforced by the church. But social institutions are not the true source of ethical values either. Conventional morality is indeed organized by religious, political, and legal institutions, but even they themselves do not believe or experience the institution as the source of moral authority, merely its arm. Where then is the source to be found, and what capacity is available to us to tap that source in order to make moral judgments?

In a recent paper on Feynman's unanswered question, Herman Daly likened the moral sensibility in the human being to a compass needle aligning itself with the moral magnetic field of the universe.⁶ He conceived the moral order as outside us and pre-existent. This is not unlike the moral equivalent of conventional scientific realism of the sort Lord Kelvin embraced. The ten commandments are, in essence, "out there" as metaphysical realities. The magnetic field, by the way, is not Lorentz invariant; that is, in some reference frames it is zero. In such analogous moral frames is there then no moral order? This suggests that we look more carefully at the basis for moral order. If there is no neat moral code "out there" to be read off and carved into stone, then how might real-life morality arise? Are there high level principles (as there are in physics) which may be implemented in specific ways in specific contexts but the principles themselves are invariant across reference frames. (Remember the laws of physics are true in all inertial frames, that is the principle of relativity).

As an aside, I would like to state that while our particular ethical judgments must be made in terms of our own frame, I am not advocating moral relativism of the conventional sort. Einstein's theory is not one that spawns a lawless universe. In fact it shows the profound ways in which the universe is ordered, indeed must be ordered in accord with the principle of relativity in order to be coherent. Likewise for the moral universe. I suspect that we are better off thinking in similar terms about moral principles. What might be the high moral principles that work across reference frames? "Do unto

⁶ Herman Daly, "Feynman's Unanswered Question," *Philosophy and Public Policy Quarterly*, vol. 26, no. 1/2, (Winter/Spring 2006), pp. 13-17.

others as you would have them do unto you.” And there are Rawls’s related principles of justice (behind a veil of ignorance).⁷

What of the human faculty for moral insight? I believe that here, as in science, reasoning can be an important aid to moral reflection, clarifying circumstances and anticipated consequences, but left to itself reason alone is not competent to judge morally. No, here also, like Porete, I would maintain that independent of social institutions and the Virtues they espouse, the individual possesses moral sensibilities sufficient to allow for genuine moral insight. These sensibilities include moral imagination, compassion, and moral intuition. Moral imagination allows us to enact imaginatively the situation of the other, that is, to exchange places with them. In addition compassion is needed; not only must we imagine the other’s circumstances but we need to feel the impact of those circumstances, in some measure, as the other would feel them. The capacity for compassion permits such “feeling with.” Imagination and compassion become then the basis for our moral intuition. Love is the word that we use to describe this combination of participation and compassion. Love in this way becomes a power of knowing which is not a distant objectifying act of ratiocination, but a living into and with that can yield moral insight.

Towards an Epistemology of Love

⁷ John Rawls, *A Theory of Justice*, (Cambridge, MA: Harvard U.P. 1971/1999).

We are unaccustomed to thinking of love as more than an emotion or mere sentiment. Yet the stages of love as a means of knowing can be elaborated more fully.⁸

They include:

- Respect – When approaching the object of our contemplative attention, we do so with respect and restraint. Concerning the relationship to the beloved, Rilke maintained that “a togetherness between two people is an impossibility.”⁹ Instead of an easy fusion with the beloved, Rilke recommended that we “stand guard over the solitude of the other.” Likewise, I feel that the first stage of contemplative inquiry is to respect the integrity of the other, to stand guard over its nature, over “its solitude,” whether the *other* is a poem, a novel, a phenomenon of nature, or the person sitting before us. We need to allow it to speak its truth without our projection or correction.
- Gentleness – Contemplative inquiry is gentle or delicate. In his own scientific investigations, Goethe sought to practice what he called a “gentle empiricism (*zarte Empirie*).”¹⁰ If we wish to approach the object of our attention without distorting it, then we must be gentle. By contrast, the empiricism of Francis Bacon spoke of extracting nature’s secrets under extreme conditions, putting her to the rack.
- Intimacy – Conventional science distances itself from nature and, to use Erwin Schrödinger’s term, *objectifies* nature.¹¹ Ideally, science disengages itself from phenomena for the sake of objectivity. Contemplative inquiry, by contrast, approaches

⁸ See also Arthur Zajonc, ““Love and Knowledge: Recovering the Heart of Learning Through Contemplation,” *Teachers College Record*, vol. 108, no. 9, September 2006, pp. 1742-1759.

⁹ Rilke, p. 28.

¹⁰ Goethe, *Scientific Studies*, translated and edited by Douglas Miller (New York: Suhrkamp, 1988), p. 307.

¹¹ Erwin Schrödinger, *Mind and Matter* (Cambridge: Cambridge University Press, 1967), Chapter 3.

the phenomenon, delicately and respectfully, but it does nonetheless seek to become intimate with that to which it attends. One can still retain clarity and balanced judgment close-up, if we remember to exercise restraint and gentleness.

- Participation – Gentle intimacy leads to participation by the contemplative inquirer in the unfolding phenomenon before one. Outer characteristics invite us to go deeper. We move and feel with the natural phenomenon, text, painting or person before us; living out of ourselves and into the other. Respectfully and delicately, in meditation we join with the other, while maintaining full awareness and clarity of mind. In other words, contemplative inquiry is experientially centered in the other, not in ourselves. Our usual preoccupations, fears, and cravings work against authentic participation.
- Vulnerability – In order to move with the other, in order to be gentle in the sense meant here, in order to participate with the other truly, we must be confident enough to be vulnerable, secure enough to resign ourselves to the course of things. A dominating arrogance will not serve. We must learn to be comfortable with *not* knowing, with ambiguity and uncertainty. Only from what may appear to be weakness and ignorance can the new and unknown arise.
- Transformation – These last two, participation and vulnerability, lead to a patterning of ourselves on the other. What was outside us, is internalized. Inwardly we assume the shape, dynamic, and meaning of the contemplative object. We are, in a word, transformed by contemplative experience in accord with the object of contemplation.
- *Bildung* – Education as formation. The individual develops, or we could say is sculpted through, contemplative practice. In German education is both *Erziehung* and *Bildung*.

The later stems from the root meaning “to form.” The lineage of education as formation dates back at least as far as the Greeks. In his book *What Is Ancient Philosophy*, the French philosopher Pierre Hadot writes of the ancient philosopher, “the goal was to develop a *habitus*, or new capacity to judge or criticize, and to transform – that is, to change people’s way of living and seeing the world.”¹² Simplicius asked, “What place shall the philosopher occupy in the city? That of a sculptor of men.”¹³ Or as Merleau-Ponty put it, we need to “relearn how to see the world.”¹⁴ In an essay on science, Goethe declared that, “every object well-contemplated creates an organ of perception in us.”¹⁵ Parker Palmer’s important work also centers on education as formation.

- Insight – The ultimate result of contemplative engagement as outlined here is organ formation, which leads to insight born of an intimate participation in the course of things. In the Buddhist epistemology this was called “direct perception;” among the Greeks it was called *episteme* and was contrasted to inferential reasoning or *dianoia*. Knowing of this type is experienced as a kind of seeing or direct apprehension, rather than as an intellectual reasoning to a result.¹⁶

Many are the sources of deception, but that does not mean that moral insight is impossible. Three-dimensional objects, such as a wire square, may look deceptively like a line (when viewed edge-on), or rhombi from another angle, but by completely rotating

¹² Pierre Hadot, *What is Ancient Philosophy*, (Cambridge, MA: Harvard University Press, 2002), p. 274

¹³ Quoted by Hadot, p. xiii.

¹⁴ Quoted by Hadot, p. 276 and Maurice Merleau-Ponty, *Phenomenology of Perception*, (London: Routledge, 1962), Preface.

¹⁵ Goethe, *Scientific Studies*, “Significant Help Given by an Ingenious Turn of Phrase,” p. 39

¹⁶ Douglas Sloan, *Insight-Imagination* (Westport, CT Greenwood Press, 1993); Robert J. Sternberg and Janet E. Davidson, *The Nature of Insight* (Cambridge, MA: MIT Press, 1995).

the object we can intuit its real shape. So too here. Patience, variation, etc., can often clarify morally complex situations, opening them to moral intuition. In fact, in my view, genuine moral agency arises only in those cases when we are free of all such deception, whether they stem from the external compulsions of society and family, or internal biological and psychological forces. But once free of them all, how do we act, whence come the moral insights that guide free human action? Here we come back to Porete and to her love of Love, which becomes a firm and reliable faculty of moral knowing. One worth dying for.

Contemplative traditions and the cultivation of contemplative insight

Porete was a beguine, which means that she was a contemplative. She had grown up in the Church of the Little practicing the conventional Virtues as prescribed by the Church. But gradually she matured and fell in love, in her case with Love itself. In other words she practiced love. In many spiritual traditions one practices love, deepening it, extending to larger and larger “circles of affection,” as the Stoics called it. I see the contemplative traditions as very important sources for practices that aid us in the refinement and strengthening of our moral sensibilities of imaginative participation, compassion and moral intuition/insight. Goethe once remarked that “every object well-contemplated opens an organ within us.” By practicing love, by contemplating the Virtues well, we become free and are possessed of the high faculty of moral intuition and insight. Do we not recognize exactly this faculty in those we most admire, do we not, in

the end, rely on this capacity ourselves. Experience, in this high sense, is the ground of moral agency for the free human being.

Science is as much a matter of the heart and of sympathetic feeling as it is of reason and experiment. Einstein wrote concerning scientific intuition and the heart: "...only intuition, resting on sympathetic understanding, can lead to [these laws]...the daily effort comes from no deliberate intention or program, but from the heart." One must return again and again with respect and delicacy to the subject at hand. Only then are the capacities of understanding and insight formed. The image I have of this process is that by attending to the object of research (candle in the drawing), the organ of perception is formed. The process repeats: attention-formation, attention-formation...

In her remarkable biography of the Nobel laureate Barbara McClintock, Evelyn Fox Keller described McClintock's knowing as "a kind of seeing."¹⁷ Concerning insight, McClintock urged that one must "let it come to you... hear what the material has to say to you;" get a "feeling for the organism." (p. 198). Keller called this a learning by "identification," that requires one "...dwell patiently in the variety and complexity of organism." In a lecture near the end of her life, McClintock urged a group of Harvard graduate students "to take the time and look." As Keller commented, "The pace of current research seems to preclude such a contemplative stance" And yet, it is my conviction that whether in the research laboratory or in matters of ethical conduct, our most creative and inspired insights come from exactly such a contemplative stance. We should take the time to look, to attend fully and patiently; to allow the world to work

¹⁷ Evelyn Fox Keller, *A Feeling for the Organism*, (NY: W.H. Freeman, 1983)

itself into us and shape us. Then might the high principles we seek -- with the heart as well as the mind -- gradually become apparent to us, and they will permit us to both understand through identification and to act out of compassionate moral intuition.

