

All Shapes of Light: The Quantum Mechanical Shelley

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23

THIS CHAPTER explores the conjunction of two metaphorical models: one is generated by Shelley's usage of figures and theories of light, especially in "The Triumph of Life;" the other is derived from Niels Bohr's interpretation of quantum mechanics, known as complementarity. Both models are defined by the conjunction of two features: the first is the metaphoric duality of light, combining wave and particle imagery; the second is the suspension of classical causality. The theoretical economy based on these features leads to a radical dislocation, or deconstruction, and a reinterpretation of the classical understanding of interpretive and theoretical processes. This reinterpretation has deep-seated affinities with postmodernist theory and in some of its aspects moves beyond it. The chapter thus relates Shelley, postmodernism, and modern or postmodern science. These connections are not surprising given Shelley's interest in science, especially optics and atomic theory, which were brought together by quantum physics a century later. Such interests by themselves, however, can account neither for the complexity of the models at issue nor for their implications. Nor can they encompass the scale of Shelley's achievement. Shelley develops a conceptual and metaphorical economy that gives him a very special place in the intellectual landscape of modernity and postmodernity and their relationships to science. In 1930 Karl Grabo pronounced Shelley "a Newton among

poets."¹ By that time, he could have said "Bohr" instead of "Newton" and spoken of quantum mechanical science and the quantum mechanical Shelley.

COMPLEMENTARITY

Complementarity is a representational and theoretical framework developed by Bohr in order to account for what he calls *complementary* features—features that are mutually exclusive but equally necessary for a comprehensive description of quantum phenomena. In this interpretation, quantum mechanics is defined through a conjunction of two forms of complementarity.

The first is wave-particle complementarity, reflecting the duality of the wave and particle behaviors of quantum objects, and relating the continuous and the discontinuous representations of quantum processes. Light, classically only a wave phenomenon, has two shapes: At times it behaves as particles (photons), at times as waves. There have been classical corpuscular theories of light, such as Newton's. Prior to quantum mechanics, however, for light and matter alike, there was always either one form of representation or another, never a complementary combination of both. By contrast, in order to develop a coherent account of their object, quantum theories must employ both representations, without subjecting them to a classical, such as Hegelian, synthesis.

The second complementarity is the complementarity of coordination and causality. It dislocates the causal dynamics by means of which the behavior of physical objects is determined and that allows one to know with certainty their positions and motion. It suspends the *claim* of such causality, grounding all classical physics and, one might add, all classical metaphysics. In Bohr's defining formulation, "The very nature of quantum theory . . . forces us to regard the space-time co-ordination and the claim of causality, the union of which characterizes the classical theories, as complementary but exclusive features of the description, symbolizing the idealization of observation and definition respectively."² The term *idealization* is crucial. Both coordination and causality must be seen as idealizations, symbols, or metaphors. This understanding defines Bohr's interpretation and establishes its proximity to postmodern theories, on the one hand, and Shelley's poetic practice, on the other.

The mathematical counterpart of the complementarity of coordination and causality is Werner Heisenberg's uncertainty relations. Disallowing the

simultaneous precise measurement of quantum variables, such as position and momentum, uncertainty relations entail an irreducible loss in representation affecting any quantum system.³ The result of this loss, however, is not the impoverishment but the enrichment of quantum systems, defined by an irreducible, infinite multiplicity and incessant transformations of their elements. These systems are simultaneously both irreducibly incomplete or fragmented and irreducibly rich.

The features just described—indeterminacy, the radical loss in representation, fragmentation, irreducible multiplicity—are related to many by now familiar features of the postmodernist landscape. I shall not elaborate on these connections here any further, for the preceding discussion in effect spells them out and partly depends on them. Complementarity itself can be defined in very general terms, well beyond physics. One may further expand the concept of complementarity, beyond designating only *mutually exclusive* features. Thus understood, complementary relations, which may be paired or multiple, are neither simply mutually exclusive nor simply subjected to a full synthesis. Instead, they manifest at times one of their complementary features, at times another; at times they show these features operating jointly, at times in conflict or inhibiting each other. They may also enter new complementarities at any point.

Shelley's texts offer extraordinarily rich metaphorical models for exploring such complementary economies. Often using light itself as their main figure, they fragment and complementarize all shapes or figures, and all disfigurations, of all light—physical, conceptual, or metaphorical—and all shapes or figures of causality and decausation: in fact, all shapes and figures. Wave and particle imagery can be traced throughout Shelley's works, where it often accompanies the dislocation of causality, on the one hand, and an economy of multiplicity, on the other (although Shelley enacts multiplicities in a great variety of ways). Here I shall restrict myself to "The Triumph of Life," arguably the most quantum mechanical and the most postmodern, or even post-postmodern, of Shelley's works.

THE TRIUMPH OF LIGHT

In "The Triumph of Life" the wave-particle complementarity of light, the radical loss in representation and causality, and the plural character of cognition and interpretation are jointly introduced and made to interact from the outset:

Swift as a spirit hastening to his task
 Of glory and of good, the Sun sprang forth
 Rejoicing in his splendour, and the mask
 Of darkness fell from the awakened Earth

 and at the birth
 Of light, the Ocean's orison arose

(lines 1-7)

The *inaugural* figure or shape of the poem is the Sun—a shape of light, “a shape all light.” Even leaving aside the general suspension of all unconditionally original events and figures in view of Derrida’s deconstruction of (the concept of) origin and related developments from Nietzsche on, it would be impossible to speak of the poem’s *first* or original figure in view of Shelley’s practice of metaphor.⁴ Here the physical, material sun is preceded by its metaphorization as “a spirit”—an ideal or idealist figure juxtaposed with “matter.” “Swift,” however, preceding “spirit” and accompanied by “hastening to his task,” reinscribes a certain materiality into the network. This rematerialization is reinforced by the title, “preceding” the opening lines and suggesting the all-conquering material force of life as life-death. With other signifiers grafted into the title and the first lines—“triumph,” “try,” “lie,” “life,” “light,” “eye,” “I”—the picture becomes still more, finally irreducibly, complex and complementary. The inscription thus suspends both the general possibility of absolutely original figures and the possibility of any unconditional claim upon either material or spiritual grounding of the interpretive process. The complementary aspect of Shelley’s inaugural figuration has another important, if textually deferred, manifestation. The figure of the Sun as “a shape all light” is parallel-complementary to a female shape all light, encountered by Rousseau later in the poem, but rendered here by its masculine counterpart as a father figure.

If the inaugural figure of the poem is a shape of light—the Sun, its inaugural event is “the birth of light.” This “event” is again neither first, absolutely original, nor single or unitary, but is irreducibly disseminated along various gradients. The phrase connotes and connects, without full synthesis, the birth of the day, the birth of modern civilization (after the exile from Paradise), and the physical processes of the birth of light, both to its macroorigins—the light originating within the stars—and to its microorigins—the atomic processes through which physical light is born. “The birth of light” is also the birth of knowledge, for the poem’s opening follows the exile from Paradise, prompted by the desire for the excess of

knowledge. Later in the poem, the Sun itself, "the true Sun" (line 290), becomes the figure of reason and knowledge, human or divine—the figure of "en-lighten-ment" in its broadest sense, as Shelley problematizes the value and the very possibility of enlightenment in both historicopolitical and theoretical contexts. In its perhaps greatest generality, "the birth of light" is the birth of birth itself—the figure relating to the (im)possibility of origin.

The poem enacts a deconstruction of causality by using, separately or in combination, all three figures—"the birth of light," "birth," and "light." The conjunction is forceful and fitting. The origin of any perceptive and interpretive event depends—conceptually, metaphorically, and physically—on the possibility of light, on one shape of light or another. "Glimmering" light—unsteady, continuous-discontinuous, particlelike and wavelike light—pervades the poem (*glimmer* is one of its key words), suggesting the problematic nature of classical models of origin, causality, and cognition.

In this sense, "the birth of light" might still be the originating or precomprehending "event" and metaphor of the poem insofar as, analogously to the Derridean economy of *différance*, *trace*, and *writing*, it connotes simultaneously the possibility and necessity of knowledge—en-lighten-ment—and the impossibility of complete knowledge. There is never enough light, as it were, even and particularly when there is too much light, when the light is excessive, as in "The Triumph of Life." In quantum physics, too, or already in relativity, light as a carrier of information and, thus, of a certain (material) en-lighten-ment is a necessary, although not sufficient, condition for all knowledge. We must *see* in one way or another in order to perceive (*produce*) and connect events and establish causal sequences between them, although we have, when we have it at all, only limited power in determining what specific shape these events, connections, and causalities will take. As Einstein's theory of relativity demonstrated, the specific material features of light (whose speed is always constant and limits the transmission of all information) affect all causal relations and demand a different physics and a different philosophy of causality. Quantum physics was to deconstruct causality and, by implication, subjectivity even more radically.

Shelley in fact makes the birth of light—the dawn—a quantum rather than a continuous event, a quantum leap—"the Sun *sprang* forth." The image is analogous to the quantum mechanical picture of light as photons emitted discontinuously and acausally, as, according to the quantum postulate, electrons shift their orbits, or more precisely their levels of energy in the atom. Paul de Man was the first to notice this transformation of dawn in the poem

in his "Shelley Disfigured": "The most continuous and gradual event in nature, the subtle gradation of the dawn, is collapsed into the brusque swiftness of a single moment." Shelley institutes a kind of poetic quantum postulate; and, as in quantum mechanics, once the birth of light can be a discontinuous and acausal event, it demands a deconstruction of perceptual and conceptual continuity and causality. This deconstruction, enacted throughout the poem, announces a transformation of all our ideas about nature, representation, perception, light, and finally life. All other events related to vision or light and many other appearances (made possible by one light or another) depicted by the poem obey this acausal quantum law, including the appearance of Shelley's vision itself ("And then a Vision on my brain was rolled"; line 40); the appearance of the chariot and the Shape of life, or life-death; the appearance of Rousseau, who is also introduced as a shape ("the grim Feature"; line 190) without light and without life; and the appearance of a shape all light to Rousseau. All these are "new vision[s], never seen before" (line 411). They may appear to be, in de Man's words, "brusque and unmotivated,"⁵ but they may be instead both motivated and unmotivated, discrete and continuous, causal and acausal—in short complementary in all their aspects.

The figure of light may also be read as the figure of the very process of figuration—the figure of the efficacy (to oppose this term to source, origin, or cause) of all possible figurations and causality. According to de Man, the shape is "the figure of the figurality of all signification." From the present perspective, it would be the figure or antigure—or, like Derrida's *différance*, neither a term nor a concept—of the complementary production and deconstruction, figuration and disfiguration, of all figures. Any given shape or figure of light—or of anything, including figuration itself—can only be an effect of this noncausal efficacy. Shelley's text functions through a complementary process that disfigures a great deal but also produces and transforms figurations, without subjecting them to classical synthesis. In closing his essay, de Man makes the following strong claim: "*The Triumph of Life* warns us that nothing, whether deed, word, thought, or text, ever happens in relation, positive or negative, to anything that precedes, follows or exists elsewhere, but only as a random event whose power, like the power of death, is due to the randomness of its occurrence."⁶ Perhaps the poem instead tells us that the power of death—and of life—is always a Democritean play of complementary chance and necessity, multiplicity and oneness, centering and decenter-

ing. The disfigurative power of the processes enacted by the poem is, it is true, nothing short of extraordinary. It is equally important, however, to understand the accompanying productive—figuring—aspects and the complementarity of both figuration and disfiguration in these processes. This complementary economy emerges in the most extraordinary way in the central event of the poem, Rousseau's encounter with "a shape all light," which *reflects* and *embodies* (in either sense)—and refracts—all shapes of light:

there stood

Amid the sun, as *he* amid the blaze
Of his own glory, on the vibrating
Floor of the fountain, paved with flashing rays,

A shape all light, which with one hand did fling
Dew on the earth, as if *she were the Dawn*
Whose invisible rain forever seemed to sing

A silver music on the mossy lawn,
And still before her on the dusky grass
Iris her many coloured scarf had drawn.

(lines 348–57, emphasis added)

"Iris" is the rainbow—the paradigmatic event of physical and poetic optics—that will return with even more power later in the text. The dawn—"the birth of light"—returns now in all its (or her) quantum glory, as Shelley continues the interplay of the masculine and feminine shapes of light. "That light's severe excess" (line 424)—the dose of radiation, as it were—reaches beyond the critical limit, however, leading to a meltdown, a kind of intellectual Chernobyl. It is no longer "the physics of paradise," to borrow Stuart Curran's description of act 4 of *Prometheus Unbound*, rendering a happier moment.⁷ The tragic landscape encountered by Rousseau is both *postlapsarian* and *postmodern*:

like day she came,
Making the night a dream; and ere she ceased

To move, as one between desire and shame
Suspended, I said—"If, as it doth seem,
Thou comest from the realm without a name,
Into this valley of perpetual dream,

Shew whence I came, and where I am, and why—
 Pass not away upon the passing stream." (lines 392–99)

"Like day she came" establishes another brilliant parallel with the opening of the poem. The relationship between, to return to Bohr's phrase, "the space-time co-ordination and the claim of causality" ("whence I came, where I am, and why") is here subjected to the most radical uncertainty relation heretofore seen in Western history. Spinoza, Rousseau, Hume, and other precursors do help Shelley along the way. Shelley's contribution, however, remains unique both in the radical nature of his questioning and in the complexity of the processes and figures he engages. The "event" also enacts a uniquely Shelleyan conjunction of *nous*, *physis*, and *eros*—mind, matter, and eroticism:

"Arise and quench thy thirst," was her reply.
 And as a shut lily, stricken by the wand
 Of dewy morning's vital alchemy,
 I rose; and, bending at her sweet command,
 Touched with faint lips the cup she raised,
 And suddenly my brain became as sand
 Where the first wave had more than half erased
 The track of deer on desert Labrador,
 Whilst the fierce wolf from which they fled amazed
 Leaves his stamp visibly upon the shore
 Until the second bursts—so on my sight
 Burst a new Vision never seen before. (lines 400–11)

These images form an immense catachrestic conglomerate, joining the postmodernist and the quantum mechanical Shelley. The metaphors include those borrowed from classical optics, such as the reflection and refraction (as distortion or disfiguration) of light in water. At this point in history, one can also think of the violence of subatomic processes, let us say, the gamma ray (intensified light) bombardment of subatomic particles and the violent interaction of waves and particles. The pictures we have of such processes can only be traces, or traces of traces, of such collisions. But these pictures (one might think of corresponding photographs) are similar to what Shelley's metaphoric technology renders here by way of mixing the traces of ocean waves and the tracks of a pursuit left on the particles, the *grains* of sand, as this

life-death—and of the poem itself and its future history. Again repeating and parodying the sunrise of the opening lines—"the mask / of darkness fell from the awakened Earth" (lines 3-4)—the figuration by means of light is converted into metaphoric disfiguration by the next wave—or particle-wave—of the poem's textual drift:

As the sun *shapes* the clouds—thus, on the way
 Mask after mask fell from the countenance
 And form of all, and long before the day

Was old, the joy which waked like Heaven's glance
 The sleepers in the *oblivious* valley, died,
 And some grew weary of the ghastly dance

And fell, as I have fallen by the way side,
 Those soonest from whose forms most shadows past
 And least of strength and beauty did abide.

(lines 535-43, emphasis added)

Even here, however, alongside oblivion and obliteration, the sun still *shapes* the clouds. All Shelley's signifiers—shape, sun, light, clouds—also inscribe productive metaphoric play enabled by and enacting manifold shapes of light. This complementary conjunction of production, preservation, and obliteration—rendered earlier by the West Wind, "Destroyer and preserver"—structures Shelley's textual field. The indeterminacy and complementarity of this field continuously make us return to the questions asked by "The Triumph of Life:" What is knowledge? What is interpretation? What is reading? What is anything? Who are we, and whence did we come and why? In order to ask these questions or in order to reask them after postmodernism and other postisms and afterisms, one must write something like "The Triumph of Life," or perhaps create a textual field still more radical than Shelley's poem or such paradigmatic (post)modernist textual machines as those of Joyce or Blanchot. Reading, even a work as great as "The Triumph of Life," may not be enough; and this insufficiency of reading is among the many great lessons of the poem.

Would the poem also imply the insufficiency of writing, and, in a kind of counterargument to the *Defence*, specifically of poetry, either as literature or as the extended field so designated by Shelley? Would this insufficiency of all writing—oral or written, or painted, sculpted, danced, musically performed or composed, all of which are enacted in the course of the poem—be a great

lesson of life, in whose history writing, even in Derrida's sense (arguably the broadest sense available for now), is only a small episode? The radical uncertainty enacted by the poem also suggests the possibility of its death for material, intellectual, cultural, and political reasons. For all we *know*, the poem's existence, particularly in its present form, is a complex interplay of chance and necessity that could have led to its "death" at many points in its history. Life conquers all—all shapes of light and enlightenment, or anti-enlightenment, all modernisms and postmodernisms, or all archaisms or prearchaisms—all reading and all writing. But then, "What is life?":

"Then, what is Life?" I said . . . the cripple cast
 His eye upon the car which now had rolled
Onward, as if that look must be the last,

And answered . . . "Happy those for whom the fold
 Of (lines 544-48, emphasis added)

I break off here, as Shelley does, finish or leave it unfinished, as Rousseau or Shelley casts his eye (or I) upon life-death, rolling onward. Rousseau's or Shelley's eye—or die—is cast, perhaps, since this event too is subject to the incalculable Democritean play of chance and necessity. The signifier "die" also inscribes death, as perhaps it must—"as if that look must be *the last*," the poem says. "Happy" somehow manages to get in, even if only as a signifier left suspended without its signified: "Happy those." "The fold of . . ." is another signifier that would need a long analysis. One cannot perhaps finish or, complementarily, finish-*un*finish, any text, at least for now, better than with this question: "Then, what is life?" "The Triumph of Life" continues to be read and will continue to be read, at least for a while, even though and because it inscribes the death of reading and the death of writing, and thus its own death. Some indeterminate quantum-like force continues to move it *onward*, as it continues to invoke "happy those for whom the fold of. . . ." But happy, who?

Chapter 23: ALL SHAPES OF LIGHT

1. Karl H. Grabo, *A Newton among Poets: Shelley's Use of Science in Prometheus Unbound* (Chapel Hill: Univ. of North Carolina Press, 1930).
2. *The Philosophical Writings of Niels Bohr* (Woodbridge, Conn.: Ox Bow Press, 1987), 1:54–55. The literature on the subject is by now enormous. I have considered

the relationships between modern physics and critical theory in detail in *Complementarity: Anti-Epistemology After Bohr and Derrida* (Durham, N.C.: Duke Univ. Press, 1994).

3. These measurements can be mathematically represented and are often interpreted in terms of probability or statistics. As Bohr warns, however, conceptually this language can be misleading.

4. See especially Jacques Derrida's "White Mythology: Metaphor in the Text of Philosophy," in *Margins of Philosophy*, trans. Alan Bass (Chicago: Univ. of Chicago Press, 1982), 207-71.

5. Paul de Man, "Shelley Disfigured," in *The Rhetoric of Romanticism* (New York: Columbia Univ. Press, 1984), 117.

6. *Ibid.*, 117, 122.

7. Stuart Curran, *Shelley's Annus Mirabilis: The Maturing of an Epic Vision* (San Marino, Calif.: Huntington Library, 1975).