Hakim Bey
Quantum Mechanics & Chaos Theory: Anarchist Meditations
on N. Herbert's Quantum Reality: Beyond the New Physics

Retrieved on April 21st, 2009 from www.hermetic.com

Hakim Bey

Quantum Mechanics & Chaos Theory: Anarchist Meditations on N. Herbert's Quantum Reality: Beyond the New Physics

32. Fleshing out the vision of a world somehow based on the mind-boggling perceptions of QM linked with the alien realizations of "oriental wisdom" — a world which lives with ideas such as non-locality, particles which travel backwards in time, alternative universes, randomicity at the heart of creation, etc. etc . . . this is properly the work of Utopian Science Fiction — at this point in history. Perhaps within a few years it will become the province of revolutionaries, artists, philosophers — the unacknowledged legislators of a lawless future — anarchs of the new paradigm.
33. QM is said to be "complete" — but then so are all scientific systems in their moment of power. QM should by no means be fetishized either by scientists or poets, since Quantum Theory itself may hold the seeds of a paradigm which overthrows even QM. The tao which can be spoken is not the tao; the moment Quantum Theory presents itself as "complete," it must be at once attacked. Chaos theory *seems* to predict that Quantum Theory will flourish as long as it remains "incomplete," not tied down on any Classical (or even non-Boolean) procrustrean beds-metalogical, metalinguistic, essentially unstructured — "free," like reality itself — which is a state not of Anarchism but of *anarchy*, even to the very roots of being.

Chaos Theory seems to falter here. After all, total destruction is as much a "type" of chaos as the most benign visions of Bakunin or Stirner. In effect the social & economic results of the new paradigm depend on forces other than those described or controlled by the paradigm, whatever its claims to absoluteness. For instance, an economy which mirrors this paradigm will almost certainly involve the abolition of "work" as we know it (a relic of Classical physics) — but what replaces it may either enslave us more miserably than "work" could ever accomplish, or it may liberate us in harmony with the visions of "zero-work" radicals, neo-situationists & anarchists.

29. Similarly Chaos Theory can make no predictions about the development of technologies which mirror the paradigm, such as telepathic signaling, FTL spaceships, ansibles, controlled ESP or other fancies indulged in by fantasists (including me). Social change resists all such sibylline seductions, since it involves the incalculability of consciousness itself, & of human history. I can foresee Quantum dystopias as easily as Utopias.
30. Given all these caveats however. Chaos Theory still envisions a Quantum-Social-Paradigm with distinctly anti-authoritarian implications — in one sense a reprise of the Paleolithic/shamanic worldview, in another sense wildly post-postmodern. Such a "movement" or change would transcend all current definitions of Anarchism, whether communist, syndicalist, libertarian-capitalist or individualist. So far there is no name for what I'm talking about.
31. Like Quantum Theory itself, this politique/poetique is still *emergent*. It can only be sensed as it emerges or begins to emerge from the "facts" of everyday life, just as Quantum Theory peeps out of the strangeness of Quantum facts. Somewhere in the welter of Quantum Theory & Chaos Theory the paradigm is already bom, & waits for us to assist at the mystery of its naming, of its transmutation from potentiality to actuality. In this action poets & physicists may play equal parts, for the glory of Quantum Theory is that by restoring consciousness to its theorems it has turned science once again into a type of "Natural Philosophy" — or alchemy.

1. Scientific worldviews or "paradigms" can influence — or be influenced by — social reality. Clearly the Ptolemaic universe mirrors theocentric & monarchic structures. The Newtonian/Cartesian/mechanical universe mirrors rationalistic social assumptions, which in turn underlie nationalism, capitalism, communism, etc. As for Relativity Theory, it has only recently begun to reflect — or be reflected by — certain social realities. But these relations are still obscure, embedded in multinational conspiracies, the metaphysics of modern banking, international terrorism, & various newly emergent telecommunications-based technologies.
2. Which comes first, scientific paradigm or social structure? For our purpose it seems unnecessary to answer this question — and in any case, perhaps impossible. The relation between them is real, but acts in a manner infinitely more complex than mere cause-&-effect, or even warp-&-weft.
3. Quantum Mechanics (QM), considered as the source of such a paradigm, at first seems to lack any social ramifications or parallels, almost as if its very weirdness deprives it of all connnections with "everyday" life or social reality. However, a few authors (like F. Capra, or Science-Fictioneers like R. Rucker or R. Anton Wilson) have seen Quantum Theory both as a vindication of certain "oriental philosophies" & also as prophetic of certain social changes which might loosely & carelessly be lumped under the heading "Aquarian."
4. The "mystical" systems evoked by our contemplation of Quantum facts tend to be non-dualist and non-theocentric, dynamic rather than static: Advaita Vedanta, Taoism, Tantra (both Hindu & Buddhist), alchemy, etc. Einstein, who opposed Quantum theory, believed in a God who refused to play dice with the universe, a basically Judeo-Protestant deity who sets up a cosmic speed limit for light. The Quantum enthusiasts, by contrast, prefer a dancing Shiva, a principle of cosmic *play*.
5. Perhaps "oriental wisdom" will provide a kind of focusing device, or set of metaphors, or myth, or *poetics* of QM, which will allow it to realize itself fully as a "paradigm" & discover its reflection on the level of society. But it does not follow that this paradigm will simply recapitulate the social complexes which gave rise to

Taoism, Tantra or alchemy. There is no "Eternal Return" in the strict Nietzschean sense: each time the gyre comes round again it describes a new point in space/time.

6. Einstein accused Quantum Theory (QT) of restoring individual consciousness to the center of the universe, a position from which "Man" was toppled by "Science" 500 years ago. If QT can be accused of retrogression, however, it must be something like the anarchist P. Goodman's "Stone Age Reaction" — a turning-back so extreme as to constitute a revolution.
7. Perhaps the development of QM and the rediscovery of "oriental wisdom" (with its occidental variations) stem from the same social causes, which have to do with information density, electronic technology, the ongoing collapse of Eurocentrism & its "Classical" philosophies, ideologies & physics. Perhaps the syncresis of QT & oriental wisdom will accelerate these changes, even help direct them.
8. Table of Paradigms
   With Their Spritual, Political & Economic Parallels
   I. Paleolithic — shamanic — non-authoritarian — hunter/gatherer
   II. Neolithic — polytheistic — authoritarian — agricultural
   III. Earth-centered Cosmos — theistic — monarchial/theocratic (hierarchical) — urban
   IV. Sun-centered Cosmos — monotheistic — divine right of kings — colonialism & imperialism
   V. Mechanistic universe — deist or atheist — democracy, capitalism, communism — industrial/technological
   VI. Relativistic universe — Modernism — cybernocacy — post-industrial (electronic)
   VII. Quantum universe . . .
9. Just as Modernism here parallels Relativity Theory as a sort of spiritual concomitant, so "oriental wisdom" seems to attach itself to QT. But what political systems, what economics would derive from this amalgamation?
10. QT, which attempts an explanation of the reality "behind" Quantum facts, lags far behind QM itself. Unlike Relativity, QM offers

enslaves us in false consciousness. Looked at from one point of view, nothing is real; from another point of view, everything is real; from another, "nothing is real except the Real"; from yet another, "I am the Real" (*ana'I Haqq*, a sufi "koan"). These semantricks create a set of paradoxes — and the resolution will give us an essentially metalinguistic certainty of being's oneness. Such oneness cannot be structured or defined in any way. It has no "ruler" and no "laws" — hence, ontological anarchy.

25. On a mathematical (or statistical) level, the chaotic nature of reality may manifest as randomicity; I suspect it manifests in the Uncertainty Principle as well. Whatever the truth of these speculations, I feel that Chaos Theory & Quantum Theory are moving closer & closer together. If this is so, then we may be able to predict some social implications of Quantum Theory as a "paradigm" — and thus answer the questions posed in paragraph nine — by looking at the social programme of Chaos Theory or ontological anarchy.
26. Chaos Theory, like any good theory, can be applied to anything, from physics to literary criticism — just as it can absorb energy from any kind of source, from the heretical spiritual teachings of sufis, Ismailis, Ranters, shamans or sorcerers — to QM itself. Thus it may provide the link, yoke, nexus or connection between QM & "oriental wisdom," & help define the paradigm we're looking for.
27. Chaos Theory predicts that Quantum Theory will fail to turn up any "hidden laws," hidden variables that restore some privileged class of objects or perceptions to a status of objective reality at the expense of other objects & perceptions. The anti-realists who recognize only the measuring device as real, & the neo-realists who yearn for a "Classical" resolution of QM's paradoxes, are simply proposing different ways of "saving the phenomena" — or metaphorically, of preserving reality as we know it. *Consensus Reality*. This project seems doomed from the start — at least, to us chaotes. The new paradigm will shatter Consensus Reality, & with it all authoritative representatives of scientific "truth."
28. This is not to claim that the "solving" of Quantum Theory will somehow result in an anarchist Utopia. The predictive power of

a strong & *radical* monism, in which "matter" & "consciousness" cannot be distinguished except as modalities of a single reality.

22. In effect, might one not say (as in QR4) that *the wave function never collapses* — but that there still remains *only one reality*? That there has never been a "fall" from *one* into *two*? If QR is non-local, if "phase interference" & Bell's proof mean that all Quantum-particles which connect hologrammatical instantaneous connections with each other — if all "matter" was originally (before the Big Bang) one dimensionless macro-particle/wave — then all particles are implicated in all waves, & vice versa. The universe is (as Capra says, quoting Hindu sources) a seamless net of jewels, every jewel reflected in every other. The wave function collapse in this case would constitute a mathematical description of a mode of individual consciousness & its awareness of the world, its inherent implicatedness in the totality & oneness of that world — in fact, its virtual identity with that world. The wave function collapse would then not actually describe a physical event at all; in effect, it would have never happened. The universe is now what it was & ever shall be: one reality.
23. As far as I know, this synthesis of QR3 and QR7 (lucky numbers!) violates current thinking in Quantum Theory — & perhaps even the "Quantum facts" as well. Still . . . science marches on; things may change & become even weirder. I have a strong hunch that the ongoing study of randomicity (e.g. at thermonuclear temperatures) may shed light on QR philosophy in the near future. Another source for the next breakthrough in physics may well come from brain physiology — provided it can tear itself away from rat-running & linguistic rat-holes & address itself to the problem of *consciousness*. New work on the "morphogenetic field" in biology looks promising; personally, I feel less enthusiasm for cognitive philosophy & AI research.
24. My groping attempt at a synthesis is suggested by what I call Chaos Theory, which holds to the axiom that reality itself subsists in a state of ontological anarchy. "The one gave birth to the two, the two to the 10,000 things" — but all this IS the tao & nothing but the tao. Yin & yang have no being in themselves, but act as interpenetrating modalities of the tao. The real/unreal dichotomy

no coherent ideas about "reality," only a set of statistical possibilities, tools for prediction. QM "works" — but Quantum facts remain unexplained. The excitement of the science for non-scientists lies in the way it seems to have revived speculative philosophy as an integral part of the scientific endeavor: at present, competing theories about Quantum "reality" rival any occultist or mystical excesses for sheer madness & breathtaking incredibility. In *Quantum Reality*, physicist Nick Herbert outlines eight philosophies or world views, "Quantum Realities," all based on Quantum fact but all different.

11. Quantum Reality Number One (QRI) — the Copenhagen interpretation. "There is no deep reality." Objects, everyday real things, "float on a world that is not as real." (Bohr, Heisenberg.) Emphasis on "Uncertainty," and thus comparable to Buddhist "Anti-realism" or even Berkelean Idealism. The Copenhagen "orthodox ontology" leads directly to QR2, which posits an observer-created reality in which the act of measurement gives rise to observed reality ("The moon is demonstrably not there when no one looks" — N.D. Mermin).
12. QR3 — "Reality is an undivided wholeness." Developed by W. Heitler. In this interpretation, "the observer appears, as a necessary part of the whole structure, and in his full capacity as a conscious being. The separation of the world into an 'objective outside reality' and 'us,' the self-conscious onlookers, can no longer be maintained. Object and subject have become inseparable from each other." According to Bohm, "One is led to a new notion of unbroken wholeness which denies the classical analyzability of the world into separately and independently existing parts . . . The inseparable quantum interconnectedness of the whole universe is the fun damental reality."
13. Capra's popularization of this stance in *Tao of Physics* explores possible leads in Far Eastern mysticism. But none of the "orientalists" have so far noted a much more relevant metaphysics in sufism, especially Ibn Arabi's doctrine of the oneness of being (*wahdat al-wujud*). My intuition says that Ibn Arabi might prove a goldmine to Quantum Theorists, but the "mingling of two oceans" conjured up by such an imagined confrontation would

involve decades of hard labor to grasp & contain — & so I leave it to someone else to follow up.

14. Bell's Theorem, which proves or seems to prove that Quantum Reality is "non-local," bolsters rather than deflates what we might call the taoist theory of QM, or in Herbert's phrase, QR3. *Something* in Bell's Theorem seems to be violating Einstein's cosmic speed limit — some superluminal aether or "field," or Faster-Than-Light particles — or *telepathic* particles! So far this bizarrarie can be experimentally demonstrated only though negative inference; no laboratory "hard" evidence of such a "field" (or whatever) has been uncovered. Randomicity Theory suggests that non-local phenomena will remain inaccessible — that superiuminal signaling devices ("ansibles" in SciFi terminology) will prove impossible to decode, hence useless. However, this remains unproven. If telepathy exists, then human consciousness may already be making use of such codes.
15. QR4 — "The many worlds interpretation" (H. Everett, 1957) suggests that the wave function never collapses — that every possible event actually occurs, either in "our" world or in some instantaneously created "alternative universe." The Copenhagenists deny reality altogether; Everett offers infinite realities: an elegant solution, so far totally unverifiable . . . but . . . SciFi Heaven! (I wish to expropriate one of Everett's notions, the non-collapse of the wave function, for my own fanciful synthesis [see below].)
16. QR5 — Quantum Logic. What Einstein did to Euclidean geometry, some Quantum physicist/mathematicians hope to do to Boolean (Classical) Logic. Other than making it easier to think about, I'm not sure how this new logic would relate to QR — but it sounds like a good idea.
17. QR6 — "Neo-realism." Einstein, Planck, Schrodinger, Bohm & de Broglie have all looked for ways to "save the phenomena," to discover & describe Quantum Reality *per se*, rather than take the disagreeable step of agreeing with Copenhagian anti-realisms ("Atoms are not things" — Heisenberg. "There is no quantum world" — Bohr.) Reconciling the neo-realist project with Quantum facts leads to some very peculiar positionssuch as maintaining that the world is real but "non-local."

18. Could it be that the quarrel between anti-realists & neo-realists arises from a *semantic* problem about the definition of "reality?" It looks to me as if both sides are maintaining that reality means *Classical* reality. Thus the Copenhagenists are forced to deny that ordinary objects exist — an absurdity — while the neo-realists are reduced to looking for loopholes in QM, & seem so far to have been utterly frustrated. But if QR & "ordinary reality" are *both* real, modalities of the same one reality, then the dichotomy vanishes like a delusion caused by bad grammar. The only problem then remaining is that of Quantum measurement, which asks in effect how "quantumstuff" "*becomes*" "ordinary objects?"
19. QR7 — "Consciousness creates reality." Von Neumann posits that only one kind of stuff exists, quantumstuff, & that ordinary objects are "made" of it. At some point the wave function, the all-possible nature of quantumstuff, "collapses" into a single statistical probability, a quantum jump which somehow "creates the world." Where does this occur? The only logical answer appears to implicate human consciousness as the setting of the wave function collapse. Ironic that Von Neumann, the wizard of cybernetics & strategic game theory, should have been forced to develop a math which suggests that human consciousness must be written into any complete explanation of QR. Von Neumann's interpretation is not the same as QR2, "observer-created reality," in which the observer could as easily be a measuring device as a human being; QR2 tacitly accepts a basic dualism between a real "Classical" measuring device, and Quantum unreality itself. Nor does QR7 necessarily imply Buddhist-style anti-realism or Idealism: reality *exists*, but only in conjunction or "unity" with consciousness.
20. On one hand this trend leads to a kind of neo-Aristotelian neo-Platonism — such as QR8, Heisenberg's "duplex world" of potentials and actualities, in which real objects appear almost as manifestations or hypostases of a Quantum Reality which is both more abstract & yet "more real" than everyday things.
21. On the other hand however Von N's "all-quantum" explanation of QR harks back to & strengthens the "taoist" arguments of QR3. Here, rather than a platonic modified non-dualism we get