

The Influence of Scientific Thought

One of the most important and influential books of the past two decades is Margaret Wheatley's *Leadership and the New Science, Discovering Order in a Chaotic World*. First published in 1992 and republished and expanded in 2006, Wheatley explores the worldview that framed her world as a management consultant and how it changed when she took seriously the findings unfolding in the world of science. The surety of the Newtonian world with its mental model of the world as a machine was shattered by the founders of quantum theory. She quotes two key figures:

In the twentieth century, physicists faced for the first time, a serious challenge to their ability to understand the universe. Every time they asked nature a question in an atomic experiment, nature answered with a paradox, and the more they tried to clarify the situation, the sharper the paradoxes became. In their struggle to grasp this new reality, scientists became painfully aware that their basic concepts, their language, and their whole way of thinking were inadequate to describe atomic phenomena (Niels Bohr and Werner Heisenberg: *The Turning Point*)

Modern scientists have changed their understanding of how the world works. In the machine imagery used by seventeenth century for geniuses like Newton and Descartes, studying the parts is the key to understanding the whole. This older science is also materialistic and focuses on what can be known through the physical senses. New science is different. These are only a few of the most basic points, but they are important in understanding Wheatley's changed view of leadership.

- There is a focus on the holistic. Systems are understood as whole systems
- Sub-atomic particles are observed only as they are in relationship to something else
- The human body, like the rest of nature, is viewed as an integrated system
- The earth itself is an integrated system of systems
- Chemical systems reorganize themselves into greater order when confronted with changes in the environment.
- There is a new appreciation of the relationship between change and disorder; these are understood as mirror images that contain the other; it is the partnering of these forces that creates change

In leadership terms, the Newtonian system focuses on quantity, structure and roles. In the 1990s when these did not work, organizations were "reengineered" with a focus on structure and organizational design. Western culture derived from science has focused on the individual. Quantum theory presents a vastly different world of interconnection, "a vast porridge of being" where "the universe begins to look more like a great thought than like a great machine". The

focus is not on things but on interactions and relationships. The role of the observer also plays a key part. What the observer pays attention to becomes part of the findings.

This places the leader, observes Wheatley, in the role of being a fast learner, of being acutely aware of what is happening now. We must interact with the world to see what we might create. This does not mean that we simply react; there is also an important role for the intention and the identity of the organization in terms of what it wishes to become.

If matter is reconceived as energy, the power of an organization is reconceived as relationships rather than hierarchies, functions and tasks. Thus the quality of relationships is what matters. Wheatley gives a name to that quality not always common in a leadership parlance, - it is Love. Metaphors for relationships come from the world of music and from nature, - the jazz combo and the web.

Newton's world was one which contained empty space – a lonely one. Space now is conceived as one filled with fields – real but non-material. We spend much of our lives now in cyberspace and don't discount its reality even though we can't see it. There are clearly non-material forces in our institutions – cultures, visions, values, ethics - affected by the communication of their leaders. When the message is clear and accepted, behaviour is congruent. For Wheatley, the key point is clarity, - a clear message with integrity in both words and actions. The whole organization then needs to become a beacon tower of its message. The vision statement needs to move “off the walls and walk the corridors” seeking every passerby, creating energies rather than structures.

An electron is both a wave and a particle and scientists have found it fascinating that it behaves differently when it appears to know that it is being observed. When we measure something, we interfere with it. The physicist, John Archibald Wheeler, has named this phenomenon the “participative universe”, where we impart reality to what we choose to pay attention to and ignore other parts. We each actively participate in creating our own worlds, the scientists say. Wheatley's response to this concept is to ensure that we have “more and more eyes”, that participation is the key organizational strategy as opposed to leaving the data to senior people

and experts, whose views can be neither objective nor definitive. This is what creates ownership, which she describes as the emotional investment of all the participants. She questions the value of boxes and connecting lines in traditional org charts defining our structures; the S-matrix diagrams that physicists use are, in contrast, “an intriguing network of interactions, a structure of processes and potential relationships.

Organizations are strong on stability. When physics uses the term, equilibrium, a dictionary definition describes this as “the condition of systems in which the resultant of all active forces is zero”. The second law of thermodynamics does apply to machines but the obvious exception to that law is life. Living things participate in an open system that engage with the environment, grow and evolve. Natural systems possess an innate ability to reorganize when faced with new information and they adapt. The system is not locked rigidly in a structure.

For organizations, Wheatley believes, this means a need to be open to information that is new and even disturbing, and then distribute it widely so that many can interpret it. The stability in this case comes from the clarity, referenced above, as to who we are, what we need, and what we require in order to survive. It means we are adept at working within our wider environment rather than seeing ourselves as its victim. This is exactly the opposite of what we frequently do, but, paradoxically, responding to the new and the disturbing is what ensures stability over time.

One of our pitfalls in the information ages, according to Wheatley, is our treatment of information as a thing. When we were kids playing telephone, we knew that “the content character and behaviour of information” had other characteristics. New science sees information as an organizing element, invisibly changing matter into form. Information manages us, inexhaustible, disturbing our equilibrium, creating chaos. Our attempts to control it become impossible because it has a mind of its own.

The solutions, Wheatley believes, are twofold. We need to become more interested in newness and stop trying to kill it off or keep the lid on it. We need to become much more accepting of ambiguity. The implication is that we also need to recognize that intelligence is widely distributed and see our organizations as neural networks, very like the ones that we rely on

individually every time we search the Web. The structures of organizations must respond to these fluid networks of relationship with patterns like circles or lattices. “Individually we are more like electrons, moving, merging with others, forming new wholes, being forever changed in the process”, Wheatley says. The role of the leader relates to fostering this “coming together”.

In ancient myths dealing with creation, two characters took centre stage. Chaos was endless and without form. There was also Gaia, the mother of the earth. In the Greek myth, these characters were partners creating a marriage of opposition and unity. Science has brought these mythic characters back to life, asking us earthlings to partner with Chaos, giving form and meaning to life. With modern computers, programmers have created models to show how systems evolve. If anyone has ever watched computer designed fractals or even had a close look at a head of broccoli, one can see endless repetitions of the same pattern evolving in highly different ways that are extraordinarily beautiful, moving between order and chaos. When we stand back, we shift our vision from the parts to the whole. Sometimes very small changes, - the proverbial flap of the butterfly wings, - take things in a totally different direction. The world is much less predictable than we thought. Though organizations spend much of their time measuring activity, there isn't any point where we finally know everything.

Looking at wholeness, in contrast, is a new demand and it is imperative, Wheatley says, to know what we are looking for. We need to look for recurring behaviours and themes, to step back and gain perspective. Organizations are fractal in nature. Their purpose, intent and values and the freedom of responsible individuals to make sense of them in their own way is what matters. Walking the talk is essential and it is what makes organizations recognizable.

This does not mean that patterns can't change. Once we have identified the behaviours, we can decide together if we would like to change them and work together to see what it means to live into them. The implication for leadership is that such values are not announced from the top but are entered into - through awareness, self reflection and enactment. As Wheatley says, we slowly become who we said we wanted to be. The role of the leader then is to guide the vision, foster sincere values, share organizational beliefs through embodying such principles, and help the organization reach the standards it has set for itself. It involves ensuring the previously

mentioned clarity about who the organization is. We need leaders but we don't need bosses. Since we don't know where things are headed, according to chaos theory, values are to be the main attractors and the key one as Victor Frankl observes "is not to gain pleasure or avoid pain, but rather to see a meaning". We need to know "why" and reflect on our experience and acknowledge both the positive and the sorrowful and painful aspects of our organizational life.

Wheatley looks in depth at how we deal with change. In Newtonian terms, we see machines in terms of function or breakdown. She might well have said our common attitude is "if it ain't broke, don't fix it". Scientists made the shift from looking at things to studying processes to describe change and "expressed awe and humility as they encountered the unstoppable resiliency of life" and its "boundless creativity". Thus we have to shift from looking only at the parts, but instead looking at the whole of the system. It's not that we never look at the parts, but we always need to be aware of their relationship to the whole.

Such an examination must involve the whole group. The system needs to learn more about itself from all its participants. The reality for organizations is the same as that for individuals, Wheatley says. And the truth is that any living thing will change "only if it sees change as a means of preserving itself". On this basis, she says we need to decide "whether new meaning is available and desirable", whether it will allow us to become more of who we are. We do that by making our primary conversations about the meaning we ascribe to our work. And it is the energy more than the size of the system that matters.

We must learn to participate with things as they unfold and expect to be surprised.

Leaders, then, are less like master choreographers and more like dancers. Making this change, Wheatley posits, will make us "gentler, more curious about differences, more respectful, neither more hopeful nor more pessimistic, but more patient and accepting".

In looking at how this changes leadership, Wheatley lists a partial list of new metaphors to describe leaders: gardeners, midwives, stewards, servants, missionaries, facilitators, convenors. All these suggest different relationships with both people and the physical environment that rely

on networks of employees, stakeholders and communities. It is the antithesis of rigidity that leads to a globally stable system.

This article is an excerpt from a paper entitled Perspectives on Leadership originally published in 2009 and written by Norah Bolton.