LiFT Leadership for Transition

Foundations, Principles and Inspirational Resources of **Integral Politics**

Illustration: 'Agency', drawing by Tone Bjordam, 2020

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9. Politics through a Quantum Lens

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Chapter 9
Politics through a Quantum Lens

How can integral politics contribute to transforming our approaches to urgent and interlinked global challenges such as climate change, biodiversity loss, and global inequality? To answer this question, we may need to think differently about our relationships, agency, and responsibility when it comes to transformations to sustainability. This chapter invites readers to consider new ways of viewing the relationship between individual change, collective change, and systems change. Drawing on the emerging field of quantum social science, it considers what a ***radically relational approach to consciousness****, meaning, and mattering implies for politics and political agency. By highlighting the nonlocal entanglement of individuals and groups through shared values, meaning, and language, this lens introduces new possibilities and potentials for realizing a* ***quantum leap to sustainability****. More important, it helps us to understand why we matter more than we think when it comes to generating an equitable and thriving world.*

Introduction

Power. *Interests*. *Money*. *Greed*. *Polarization*. *Populism*. *Apathy*. These are just some of the words used to describe politics today. We live in a time when democracies around the world are being challenged by individuals and groups who favor authoritarian and autocratic alternatives. The denial of rights, the degradation of nature, and the disregard for both current and future generations is becoming more and more widespread. Heatwaves, droughts, wildfires, loss of biodiversity, energy shortages, food insecurity, pandemics, and conflicts point to the need for **alternative ways of responding rapidly and collectively to interrelated problems**. Yet societies are failing to address interconnected global challenges, and the impacts and consequences of this failure are felt widely, but unequally.

It is recognized that unprecedented collaboration will be necessary to address global sustainability challenges. The long-term well-being of all species depends on a continuous commitment to reversing the consequences of centuries of degradation, exploitation, colonization, extraction, oppression, and pollution, which are often carried out to promote economic growth or wealth accumulation at any cost. Scientific research on climate change and biodiversity loss has made it clear that rapid transformations are needed to avoid severe, widespread, and irreversible consequences for life on this planet (IPBES, 2019; IPCC, 2022). Without such transformations, scientists are increasingly highlighting the risks of tipping points, or situations where a small perturbation triggers the collapse of systems that are vital to sustaining life on the planet (Steffen et al., 2018). Current approaches to politics do not seem to be up to the task of meeting the urgency and scale of the problems facing humanity today. Given the political context, how can we make a quantum leap to sustainability?

The integral perspectives on politics presented in previous chapters of this book provide insights into theories and approaches that are critical to moving society forward along a progressive, evolutionary

trajectory. They emphasize how both subjective and intersubjective factors inform politics, and they show that these can and do change over time. However, to connect integral theory and practice involves activating a quality of agency that embodies a both/and perspective – one that acknowledges both unity and diversity, while transcending dualisms of subjects and objects, humans and nature, and us and others. To achieve this, it may be helpful to explore a different perspective on politics.

In this chapter, we will look at politics through a quantum lens, opening our minds and hearts to the metaphors, meanings, and methods of quantum physics to explore what it tells us about the nature of matter and mattering. Drawing on an inquiry that I presented *in You Matter More Than You Think: Quantum Social Change for a Thriving World* (O'Brien, 2021). I will reflect on what a quantum paradigm can offer to the politics of sustainability. Quantum social science highlights entanglement, non-locality, complementarity, uncertainty, and potentiality, and in doing so, it invites us to engage differently with transformative change.

Specifically, this lens presents us with an opportunity to **reflect on our role in generating *quantum social change***, a term that describes "a conscious, nonlinear, and non-local approach to transformations that is grounded in our inherent oneness" (O'Brien, 2021, p. 4). Based on the idea that we are entangled through language, meaning, and shared contexts, this concept recognizes that our deepest values and intentions are potential sources of individual change, collective change, and systems change. How can such a lens contribute to measurable results for sustainability in today's increasingly polarized world? Below, we'll consider some of its possible implications for global sustainability, why paradigms, relationships, entanglement, agency, and fractals matter, and how they can contribute to an alternative politics.

Paradigms

Paradigms describe the dominant thought patterns that underlie theories and methods of science; they also influence policies and practices related to how we organize society. History suggests that social change emerges through a pragmatic process of inquiry, action, experimentation, mobilization, reflection, and revision. To explore and engage with alternative futures, we must be willing to challenge ourselves to think differently, act differently, and be different. In writing about the moral imagination and its role in social change, sociologist John Paul Lederach (2010) emphasizes the dangers of falling into the trap of narrowly defined dualisms. He also stresses the importance of nurturing an inquisitive capacity to engage with the complexity of relationships and realities facing the world today.

What types of realities are facing the world today? The current and immanent risks of climate change and biodiversity loss require that societies transform rapidly in an equitable, ethical, and enduring manner. Many scientists have emphasized that we have less than ten years to bend the curves on greenhouse gas emissions and maintain critical ecosystems. Although some progress has been made in the political arena, including the 2015 Paris Agreement on climate change and the Sustainable Development Goals (SDGs), the outcomes and impacts of agreements and legislation have thus far been minimal. If time is of the essence, then it is timely to consider alternative paradigms.

Paradigms and politics are closely related. Paradigms shape the ideas, concepts, images, metaphors, and memes that are used to describe reality (O'Brien, 2021). This has implications for politics: paradigms can either nourish or starve our political imagination, our visions of what type of world is possible, and our

understandings of the role that we each play in realizing these visions. Dominant paradigms often constrain how problems are defined and addressed, including what is considered realistic, legitimate, effective, and possible.

The dominant Western paradigm that has driven modernity is linked to a mechanistic view of the world (see chapters 2 and 3 on Gebser and Graves), where individuals are separate, where causality is determinate, and where "things" can be reduced to their parts. This materialistic, reductionist, deterministic, and dualistic view of the world is associated with the Enlightenment, or "Age of Reason," and it has had profound impacts on both nature and society. Consistent with Cartesian science and Newtonian physics, individuals are considered separate from each other and the environment. This tendency to *objectify* nature and "others" makes it easier to exploit and exclude human, non-humans, and nature, or to consider them disposable or expendable. The impacts of a classical paradigm and its understanding of causality are discussed in Box 1.

Box 1: Viewing the World Through a Classical Lens

When it comes to climate change and sustainability issues, we are at a critical juncture in history. For more than 30 years, sustainability policies and practices have been discussed, interpreted, and implemented through a lens that is centuries old, yet still quite powerful. The classical lens for politics was ground, edged and fit to suit the rational, mechanistic, Newtonian worldview. This lens separates humans from nature, the mind from the body, "us" from "others," and the present from the future. It produces political distortions that treats nature as "something out there" to be controlled and manipulated, and humans as objects of power dynamics rather than as **subjects possessing agency to shape a shared world**. Political agency is often limited to acts such as voting and consumption, rather than to an active engagement through dialogue and collective action.

Although this lens has been heavily criticized by philosophers, artists, indigenous peoples, spiritual leaders, and many scholars (particularly in the social sciences and humanities), a classical lens still filters the modern Western view of reality, where the world is predominantly perceived to be full of separate beings, objects or things located in an empty space. Over time, additional filters have been added to the classical lens to accommodate diverse political and economic philosophies. Some of these magnify the importance of economic growth and diminish the significance of deeper meanings and experiences. Regardless of the problem, the solutions emanating from a classical paradigm are largely technical, behavioral, or symbolic. This creates superficial rather than deep and enduring results.

The classical lens may have been considered far-sighted at one time, but now it is appears to be myopic and creates distortions that limit present-day responses to existential challenges such as climate change and biodiversity loss. Rather than perpetuating a fragmented, partial, and polarizing view of the world, the current global context invites us to view politics through a fundamentally different lens.

A quantum lens provides an alternative perspective that challenges, provokes, and invites people to engage with politics in a different way. One hundred years ago, scientists made discoveries in physics that changed their understanding of the world, at least at the subatomic scales. Quantum mechanics

introduced a world of probability and uncertainty that was difficult to reconcile with the classical Newtonian world. Quantum physics recognizes that entities at the subatomic scale can be both waves and particles and it highlights the uncertain nature of reality. It introduces concepts such as indeterminacy, superposition, entanglement, complementarity, and potentiality. Although quantum physics is typically considered to be relevant only at the atomic and subatomic scales, the division between quantum and classical worlds is blurry and increasingly questioned. For example, quantum biology explores the role of quantum processes in photosynthesis, bird navigation, and sense of smell, challenging the micro-macro distinction (McFadden & Al-Khalili, 2016). As writer Danah Zohar (2016) put it, "we actually live in a quantum world, and once we fully grasp that, nothing will ever be the same again."

Quantum physics is often referred to as the most successful theory in physics, and it has led to the development of transistors, lasers, microchips, the personal computer, and many other objects familiar to our daily lives. Technologies such as quantum computing and quantum encryption hold a revolutionary potential for the 21st century. Whether society is ready to handle the unfolding of this potential wisely is another question. One key to understanding the impacts of quantum technologies is to distinguish whether this physics is understood as nothing more than a methodological tool, or also as phenomenon that encourages us to view and relate to ourselves as intra-dependent parts of a much larger whole.

The word quantum can be generally described as a quantity or amount, such as the very small increments or parcels into which many forms of energy are subdivided. Specific to physics, it is defined as "the minimum amount by which certain properties, such as energy or angular momentum, of a system can change" (Oxford Reference, 2022). Apart from physics, biology, chemistry, information, computing, and encryption, when quantum is used as an adjective to modify nouns - including politics, economics, and social change – it triggers skepticism from natural and social scientists alike, and is written off as ridiculous or "woo woo" science. From the perspective of traditional, objective science, this skepticism is understandable, not the least because it questions dominant understandings of the nature of reality.

However, traditional science and its objective view of the world have long been challenged within the social sciences and humanities. Building on a field of inquiry known as "new materialism," scholars such as feminist philosopher and physicist Karen Barad have emphasized a relational, process-oriented view of the world, drawing attention to the importance of both human and non-human agency. Karen Barad's (2007) concept of agential realism recognizes that **space, time, and matter are not a given, but instead they are iteratively performed and produced**. Agential realism does not simply change the form of causal relations, it alters the very notion of causality, and it transforms our understanding of agency and the potential for social change.

The emerging field of quantum social science has been exploring what it means to consider individuals and societies from a quantum rather than a classical perspective. Quantum social science uses the methods, metaphors, and meanings of quantum physics to explore the world through a more holistic lens (O'Brien, 2016). Applying quantum concepts and methods to decision making, game theory, finance, linguistics, and other areas of research has provided promising insights into the nature of social and political interactions. Quantum approaches have received particular attention within the field of international relations, where they offer new ways of understanding and approaching world politics (see Box 2).

Box 2: Quantum International Relations (IR)

Quantum international relations (IR) challenges the assumption that quantum effects are irrelevant to the macro scale. It explores how social life would be explained from a quantum perspective, or as Alexander Wendt puts it, by viewing h**umans as "walking wave functions" of potentiality and possibility** that intra-act through quantum characteristics. This contrasts with conceiving of humans as discrete individuals that interact classically. Karen Barad's agential realism plays an important role in quantum IR, contributing contributes to what political scientist Laura Zanotti (2019, p. 5) refers to as "a quantum ontological imaginary for reshaping our political ethos." Potentials, processes, and practices are among the key words associated with quantum international relations. Some of the recent books that describe a quantum approach to international relations include the following five:

Der Derian, James and Alexander Wendt (editors). Quantum International Relations: A Human Science for World Politics (2022, Cambridge University Press). This edited volume makes the case for a new human science of world politics. Calling into question traditional approaches, the chapters explore what international relations would look like if it embraced quantum theory, quantum science, and quantum technology. Rather than promoting a single grand theory of international relations, the chapters explore multiple approaches, focusing on themes related to philosophy, critical theory, introspection, education, climate policy, and others. This book provokes new thinking on issues of global importance.

Fierke, Karin M. Snapshots from Home: Mind, Action and Strategy in an Uncertain World (2022, Bristol University Press). This book approaches agency and uncertainty in international relations by looking at parallels between quantum physics and Daoism, Buddhism, and Hinduism. Fierke explores the implications of a quantum turn in IR for macroscopic relations, and considers this through "snapshots" that explore questions of mind, action, and strategy from multiple perspectives.

Murphy, Michael P.A. *Quantum Social Theory for Critical International Relations Theorists: Quantizing Critique* (2021, Springer). This book works to expand our view of what is politically possible beyond the limits and constraints of our current physical imaginary. Arguing that "both quantum mechanics and critical IR interrogate rather than gloss uncertain and paradoxical elements of reality" (p. 3), Murphy sees the move from a Newtonian physical imaginary to a quantum one as a key step to opening up new questions and possibilities.

Wendt, Alexander. Quantum Mind and Social Science: Unifying (2015, Cambridge University Press). In this book, Wendt introduces quantum social theory based on the premise that "the conceptual, logical, and methodological tools of quantum theory offer the potential for revealing new social phenomena" (p. 34). According to Wendt's theory, matter is not classical and devoid of mentality. Instead, consciousness extends all the way down to sub-atomic particles. He argues that an ungrounded potentiality is part of the physical world, but a quantum physical world. Wendt considers the most important contribution of this work is to bring conscious subjectivity back into social science.

Zanotti, Laura. Ontological Entanglements, Agency and Ethics in International Relations. (2019, Routledge). This book explores the political potential of a quantum ontological imaginary for reshaping political practices. Her point of departure is that "development programs and peacekeeping interventions rely on substantialist assumptions, such as the linearity of relations of causality, the homogenous nature of political realities and the existence of constant and standard conditions across place, space and time" (p. 8). Zanotti argues that ontological imaginaries shape the way that we see ourselves in this world, and how we can make a difference in it, and her work highlights the importance of an ethics based on practice, uncertainty, and radical responsibility.

Importantly, the goal of quantum social science is not to simply extrapolate from the micro to the macro, but rather to consider the significance of quantum physics for understanding society and social processes. While quantum social science as a field of inquiry offers exciting perspectives, few of these ideas are completely new. Compelling visions of a quantum self and quantum society were described already in the 1990s, with a strong emphasis on the politics of transformation (Zohar, 1991; Zohar & Marshall, 1994). Zohar and Marshall discussed how perceptions and attitudes are creative acts, and they consider the role of pluralism, meaning and non-local connections in political transformations. As an emerging research field, quantum social science aligns with a move towards relational understandings of the world. This perspective has long been recognized by many indigenous communities and wisdom traditions, yet it has been ignored, dismissed, or erased by modern Western science, including much of social science. Relational paradigms provide new ways of seeing and being in the world, and can open up for new ways of relating with each other and with nature.

Relationships

The challenges of global sustainability and the need for an alternative politics underscores that these relationships matter, especially regarding how humans perceive of and act upon their relationships with the natural world. Concepts and ideas such as self, other, and nature have been influenced by the Enlightenment worldview and the assumptions of classical physics. Relationships viewed through such a classical lens emphasize the separation of subjects and objects and prioritize a deterministic understanding of causality.

This modern view of reality, which remains fundamental within the dominant Western worldview, manifests in everyday politics through the promotion of diverse theories and ideologies, often referred to as -isms: conservatism, liberalism, nationalism, capitalism, socialism, fundamentalisms, and so on. Tied to these are the -isms linked to judgments that underlie the marginalization, exclusion, and oppression of much of the world's population, such as racism, sexism, classism, ageism, and ableism - or a combination of any these (i.e., referred to as intersectionality). Common to many such -isms is a deep sense of separation that perpetuates disconnection, disregard, fragmentation, and sometimes violence.

Quantum physics offers both a language and a lens for looking at connections, shared meanings, and relationships – not classical relationships based on traditional notions of causality, but quantum relationships described by concepts such as entanglement and non-locality. Quantum systems are characterized by uncertainty and potentiality. From this relational perspective, we are not just a part of the system that we are transforming, *we are the system*. This draws attention to holism – an ideology that views systems as wholes rather than as parts. In contrast to -isms that are used as a means of "othering," **holism is unifying rather than divisive**. As Kurunmaki and Marjanen (2018) point out, such -isms have *rhetorical power* and can serve as future-oriented concepts that influence debates in politics, culture, and society.

The idea that experience, culture, behavior, and systems co-arise is foundational to integral theory. Quantum social science emphasizes the important role of subjectivity and interiority in politics and recognizes that the lines between "us" and "other" are constructed rather than fixed. As such, it opens up a much-needed inquiry into the fundamental nature of reality. This has important implications for

politics, which is often based on interests, identities, and grievances, as well as the desire for security, control, and power.

Approaching politics from a relational perspective compels us to move towards integral approaches, as described in previous chapters. We are particularly encouraged to look more closely at how we relate to ourselves, each other, nature, the environment, systems, and the future. Moreover, we are invited to take a deeper look at our relationships to change itself, including our understandings of the nature of reality. Looking at each other and at nature through a quantum lens recognizes that the potential for connection and coherence always exists through our inherent oneness and acknowledges that we are already connected. In other words, **politics is about how we manage our entangled relationships**.

Entanglement

Entanglement is a powerful metaphor that is used in everyday language to describe a state of being twisted or interrelated - in other words, separate but entwined. However, from a quantum perspective, entanglement is a phenomenon that describes a non-local correlation between two quantum systems. When one particle or system is measured, the state of the other is also revealed. This relationship appears to be fundamental to the nature of the universe. Yet since information cannot travel faster than the speed of light, Einstein was skeptical of entanglement, referring to it as "spooky action at a distance." However, entangled relationships do not seemingly involve direct causation or action, but a correlation of information that reveals that the particles or systems are co-related.

Once a mere thought experiment, entanglement has been verified experimentally over increasing distances and across multiple systems. Quantum entanglement changes the way that we relate to each other, and to change itself. Karen Barad (2007) talks about entanglement as fundamental to materiality, and she considers what it means for causality, materiality, agency, and the dynamics of systems. Alexander Wendt (2015) explores quantum entanglement through language, based on the idea that concepts typically have many meanings and lack definite properties in the abstract. Quantum superposition refers to all possible states of a phenomenon existing at the same time, as a wave of possibility. While all meanings exist at the same time or are "superimposed," they take on actual or specific meanings when both speakers and listeners communicate: "[I]n language what brings about a concept's collapse from potential meanings into an actual one is a speech act, which may be seen as a measurement that puts it into a context, with both other words and particular listeners" (Alexander Wendt, 2015, p. 217). How words are activated and used matters, and the context in which they are communicated plays a key role; it is a process that gives us access to other minds (Alexander Wendt, 2015).

Sustainable development, for example, can be interpreted in different ways, particularly regarding what it means for economics. Some see it as a call for "green growth," others view it as a mandate for de-growth, and still others point to its inherent contradictions, and to the inequities embedded in development paradigms. From a quantum perspective, language, narratives, and stories are important in politics, and the words, concepts, metaphors, and sentence structures used to communicate about sustainability can have spatially and temporally nonlocal effects.

Related to the politics of global sustainability, transforming the larger cultural field is indeed critical, as issues such as climate change are collective problems. The pressure to conform to acceptable representations and to the viewpoints of the majority remains powerful. Stenner and Watts (2003, p. 170) argue that "change at this macroscopic level demands **a wholesale shift in consensus amongst the population at large**. Cultural change requires that large numbers of individuals refuse the conventional perches…" The importance of **shifting the "center of gravity" in current politics** and moving beyond conventional thinking points to the significance of developmental perspectives, as discussed in earlier chapters. Polarized politics is currently directed at changing the views of others, rather than finding spaces of connection through language, shared meaning, and stories. Quantum entanglement suggests that what we say, what we do, and how we act matters, and it draws attention to the important role of both individual and collective agency.

Agency

At a time when collective action is vital, democracies around the world are increasingly under attack; at a time when more voices need to be heard, they are being systematically silenced. The head of the United Nations, Antonio Guterres, has emphasized that "democracy depends on people being seen, heard, and understood" (Guterres, 2021). People want to feel that they matter. Guterres has also called for embracing genuine participation in decision-making. This involves processes and practices that are equitable and inclusive. To achieve this involves disrupting prevailing patterns and transforming the very cultures and systems that are perpetuating inequitable and unsustainable outcomes. This calls for an integral approach to politics that is actionable and accessible to all. How, then, can individual and collective agency influence societal structures and systems?

Free will and agency are essential if the goal is to deliberately transform political, economic, social, technological, and cultural systems and structures in an equitable and sustainable manner. Agency matters because **political changes do not occur through wishful thinking and hope**. Instead, actions and interventions are needed to generate cultures and systems that are more equitable, diverse, and inclusive. Both individual and collective agency is needed to disrupt and transform inequitable and unsustainable structures that perpetuate the status quo.

From the perspective of quantum social science, social structures do not occupy some higher level of reality, rather they are part of a flat ontology, i.e., a non-hierarchical view of reality. Wendt considers structures to be "ontologically emergent. Not in the classical sense of an autonomous level of reality, but in the quantum sense of entanglement among the agents who constitute them" (Alexander Wendt, 2015, p. 259). As with Anthony Giddens' structuration theory, Wendt's quantum social theory points to agents and social structures as being mutually constitutive and emergent, i.e., not causally related. He emphasizes that until they collapse through practices, "neither agents' minds nor social structures are in determinate (i.e., actual) states, only potential ones" (Alexander Wendt, 2015, p. 260).

In arguing that **the mind and language are quantum rather than classical phenomena**, Wendt's (2015) quantum social theory considers social structures to be superpositions of shared mental states, in other words, social wave functions. A quantum wave of possibility is not real; it represents only a potentiality. We can only observe the result of the wave function's collapse within a particular context, after (or in anticipation of) a particular speech act, practice, or action. Quantum social theory provides a physical

basis for the relationship between agency and structures, yet without resorting to individualism in a classical sense. From a quantum perspectives, individuals, collectives, and systems are connected through an entangled wave of potentiality.

A quantum social paradigm is a political paradigm that empowers individual and collective agency. It recognizes that free will and consciousness are inherent to all, and that we can amplify our power when we engage with issues as both particles and waves, or what Wendt (2015) describes as "walking wave functions." Although quantum superposition suggests that structures are fixed in our minds rather than in reality, it also recognizes that some people and institutions have more power than others – a power that is given or taken on behalf of others, sometimes without legitimacy or consent. To shift entrenched power dynamics, **new forms of political agency need to be considered and enacted**.

In recent years, there has been increased attention to the concepts of political subjectivity and political agency. Viewed through a classical lens, political agency is defined in terms of autonomy and power, and it has traditionally been associated with a strategic capacity to influence the state-centered political system (Marchetti, 2013). It has largely been considered the realm of political parties, governmental actors, and individual leaders who are legitimately entrusted to represent others, or who otherwise assume power on behalf of others. This interpretation of political agency tends to be based on a rational and realist perspective that assumes that self-interest of states prevails over any collective or shared interests, including the health of biodiversity, ecosystems, and the planet. Moving beyond the classical, rational-actor model, political process theory brings in capacities of consciousness, identity, emotions, action, and moral intuition that enables one to challenge existing authorities and structures of power (Maiguashca, 2013). Political agency can thus also be defined and interpreted in more open and pluralist ways. For example, from a feminist perspective it is "a fundamentally social, contingent activity in which political subjectivity is understood not as a given, but as a continually evolving process that connects deeply personal sentiments and impulses to wider social views and actions" (Maiguashca, 2013, p. 119).

While the dominant view of agency in sustainability research tends to focus on the everyday actions of individuals, a shift in politics calls for a **combination of individual agency, collective agency, strategic agency, and political agency** (Otto et al., 2020). To meet current global challenges, broader and deeper approaches to agency are needed to capture the both/and aspects of individual and collective agency how each of us has the potential to contribute to transformations to sustainability (O'Brien, 2021). Karen Barad (2007, p. 178) considers agency as a matter of intra-acting – it is not an attribute that someone or something has, but an enactment: "Agency is doing or being in its intra-activity."

Seen through a quantum lens, Laura Zanotti views political agency as a call for a shift from normative principles to an intra-agential ethos that focuses less on normative principles, and more on micropolitical engagements that transform ethics and responsibility into practices that generate real-world results. Zanotti (2019) recognizes meaning as part of a performative process of opening and foreclosing possibilities and calls for practical processes rather than abstract principles as the basis for ethical decisions and a radical assumption of responsibility. In an entangled world of intra-actions, it is not agency per se that matters, but a particular quality of agency that matters.

This is significant, for when it comes to politics, it is not merely the expression of agency that matters — in fact, agency has often proven to be destructive or oppressive, as when used by dictators, demagogues, and those who care little about the rights of other people and species. **The quality of agency is critical,**

i.e., the underlying values that motivate actions, and how they are embodied and expressed (O'Brien, 2021). Global sustainability calls for a quality of agency that not only recognizes wholeness, but also embodies and enacts values that apply to the whole, whether it is equity, diversity, sustainability, or compassion. To realize the potential for transformations to sustainability calls for thinking, doing and being different. How do we activate a quality of political agency that recognizes entangled relationships, ethics, and potentiality, not just in theory, but in practice?

Fractals

To move beyond fragmented and polarized approaches to politics calls for generating patterns that reflect integrity at all scales. In other words, a fractal approach to politics. Fractals are self-similar patterns that repeat themselves at every scale. They can be seen in nature, and they can be generated through algebra and geometry. Examples of fractal patterns in nature include leaves, dragonfly eyes, cauliflower, or river systems; in math they include the Mandelbrot set and Sierpinski Triangle. Fractals are visible down to the smallest scale, and they represent patterns with integrity. This contrasts with fragments, which do not generate coherence across scales – in fact, fragments disrupt coherence. Drawing in insights from quantum physics, we can metaphorically think of quantum fractals as non-local, entangled patterns that influence the whole (O'Brien 2021).

Social fractals are different from fractals in mathematics and nature, in that they repeat principles and values; as these are recursively applied, fractal patterns grow. When they are disrupted at a specific scale, the pattern ends. Social fractals have been used to describe unique, context-specific patterns that represent multiple versions of the whole, or "a whole in microcosm" (Downton, 2008, p. 28). Downton (2008, p. 27) considers a cultural fractal to be "a living system of human relationships that displays the essential characteristics of the larger culture of which it is a part." In relation to sustainability, Perey (2014, 216) proposes that as a metaphor, fractals are not only tools of observation and measurement: "they are also tools of intervention into the dynamics of social systems." **Social fractals** are more than metaphors; they **can only be produced through actual iterations**, including the repetition of values, principles, processes, and procedures (Chettiparamb, 2013).

Fractal politics are imbued with a different quality and ethos. Seen through a quantum lens, fractal politics acknowledges intra-actions and intraconnections, recognizes both/and perspectives, and takes advantage of the potentials that exist here and now. Indra Adnan describes fractal politics as including "the sense that similar developments are occurring in similar patterns all over the world without any centralized agency" (Adnan, 2021, p. 119). Recognizing that "breaking the trance of disconnection" is a revolutionary act, Adnan calls for working with a fractal sensibility, rather than a linear one. This includes "Fractal organizing where people generate micro-systems for the macro system they want to emerge. These can be applied to different sectors such as the economy, social justice, or health" (Adnan, 2021, p. 203). She describes how Citizens Action Networks and Community Agency Networks support fractal agency and can contribute to a vision of a new, "cosmolocal" system that integrates people and planet. In short, every idea, initiative, or endeavor can be designed and generated with the same characteristics or qualities that supports the integrity of the whole system.

Conclusion

When it comes to the politics of social change, quantum approaches offer a different way of thinking about mind, meaning, and matter, and this can contribute to new ways of thinking about agency, including political agency. Quantum social theory challenges materialism, atomism, mechanism and determinism, the notion of an absolute space and time, and not the least, the distinction between subjects and objects. Quantum social change is based on the recognition that the individual is the collective, and that [I/We] are the system. When it comes to politics, the idea that every person matters does not refer to the individuality of the classical world, but rather the entangled nature of the quantum world. Looking at politics through a quantum lens opens spaces and opportunities for viewing relationships differently, for recognizing entanglement, and for activating a stronger sense of agency. Taken together, these can contribute to a "fractal politics" that generates new patterns, which can shift systems and cultures in ways that influence both our individual and shared realities across scales.

Quantum social theory is important to politics because it can help equity and sustainability matter and materialize in our fragmented, polarized world. Viewing politics through a quantum lens dissolves the lines between subject and object, us and other, humans and nature, local and global, and top-down and bottom-up; this introduces an actionable, agent-oriented approach to mattering to generate impacts that are both significant and substantial. In the classical world, socio-technical innovations, environmental policies, development policies and behavioral shifts are considered key strategies for meeting the Sustainable Development Goals and targets. In the quantum world, where consciousness, beliefs and intra-actions are important, and where subject-object dualism is dissolved, a different approach is needed. As Wendt (2015, p. 32) argues, "in a quantum world lots of things are possible that aren't in a classical one, and so a quantum perspective presents an opportunity not only to overcome dualism in social science, but to expand our conception of social reality altogether." This links to Hanzi Freinacht's notion of reality, as described in Chapter 7 of this publication, where reality is considered as consisting of *both* actuality and potentiality.

The concepts and ideas presented in this chapter introduce a new way of thinking about the relationship between individual change, collective change, and systems change, and why each person matters when it comes to scaling social change. The language and metaphors of quantum physics contribute to shared meanings that can amplify *both* individual *and* collective agency for social change. Language itself is important; figures of speech can be powerful in communicating facts, ideas, understandings, and meanings from one person or group to another. As Lakoff and Johnson (1980, 7) point out, "New metaphors have the power to create a new reality." They influence the reality that we perceive and experience, and also how we act. Concepts such as quantum leaps, entanglement, and potentiality can serve as powerful metaphors that open up new ways of thinking about social change. Metaphors and stories do not exist only in our minds — we embody and live them and can use them to generate fractal patterns that replicate equity and sustainability at all scales.

As the chapters in this book have emphasized, politics is influenced by different and dynamic worldviews, values, meanings, and experiences. A quantum paradigm may be able to not only contribute to the positive evolution of world politics, but also to an evolutionary jump – a quantum leap. At the very least, it can be **a way of seeing solutions that are obscured by the current lens**. At a time when probabilities do not favor a world where all life can thrive, it can be useful to focus on possibilities and potentials that exist here and now. Quantum social change tells us that each one of us matters more than we think, and this

can contribute to an equitable and thriving world. Playing with the idea of an alternative paradigm that is grounded in connections, intra-actions, and values that apply to all life on the planet holds the potential to relax fixed mindsets. At the least, it can open minds in ways that contribute to making the potential for sustainability a reality.

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