

SYSTEMS APPROACH TO THE INTEGRATION OF KNOWLEDGE

An Islamic Perspective

DR. MUHAMMED ALHASAN BIRAIMA

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

DEDICATION

This book is dedicated for most to Professor Omar Kasule, the general secretary of the International Institute of Islamic Thought (IIIT), whose guardianship had been critical for the book to see the light. Dedication also goes to brother Abdulhamid Slatch, the manager of IIIT's office for East Africa, and his research committee for their keen follow up during my writing of the book.

This book is also dedicated to IIIT for its financial support, and to the Islamic University in Uganda (IUIU) for inviting me as a visiting professor during the three years I needed to write the book. Dedication also goes to my cousin Dr. Sayed Ibrahim, founder and manager of Sprinjene company in USA, for his continuous moral and financial support for my intellectual and academic adventures. This goes without saying to my friend and student Gamal A. Khojali for his lifelong support and enthusiastic reception to the Islamic perspective of my academic research.

During my stay in Kampala, Uganda, I found great comfort in the company of my Sudanese friends Alsadig Abd-Gadir and Ridwan Abd-Rahman, as well as my Ugandan friend Tony Seruyange. I dedicate this book to them all.

This book is the culmination of my lifelong research project on Islamization of knowledge, therefore I would like to dedicate this gist to all those who played a decisive role in this intellectual journey, particularly my biological nuclear family and my family of colleagues and workers in the Institute of Islamization of Knowledge (IMAM) at the university of Gezira, Sudan.

Muhammad Alhasan Biraima

الحمد لله رب العالمين

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ISBN



Chapter One

Systems Approach to the Integration of Knowledge: **ONTOLOGICAL RATIONALE**

1 - Why the System Approach as a Strategy for Islamic Integration of Knowledge

I have chosen to suggest the system approach to the integration of knowledge (IOK) as a framework to develop a strategy for the Islamic integration of knowledge (IIOK) for many reasons:

Firstly, it is a live scientific research program for the integration of knowledge in Western academia and in many parts of the world, led by leading Western scholars across the spectrum of natural, social, and human sciences, and situated in top Western universities and specialized research centers. As such it represents the efforts for scientific reform by those who are at the frontier of scientific knowledge and technology that define the globalized world of the 21st century.

Secondly, by researching IIOK within the system framework we will ensure that we are on par with the scientific efforts of the world to integrate knowledge and the input of IIOK should be a valuable contribution and a welcome addition to these efforts.

Thirdly, the IIOK project will benefit from the most mature methodologies and methods available for integration of knowledge.

Fourthly, since the goals of the system approach to the IOK are almost the same goals as those of IIOK this should provide an opportunity to universalize the IIOK project such that non-Muslim scholars could join the efforts and assimilate the project within the global efforts to integrate knowledge, thus

making available extra human and financial resources needed to advance the IIOK. This could happen through organizing joint academic activities between relevant academic institutes and scholars.

Fifthly, once internationalized the present scholars advocating IIOK must raise the rigor of their academic skills to international standards, a standard sadly lacking in most of today's academic products of the project.

Sixthly, it is high time to move from the presently fragmented efforts of the scholars working on IIOK to a more concrete, coherent and methodologically well-defined scientific research program sanctioned by the international scientific community. Making such a strategic step will pool together and integrate the meagre scholarly resources currently involved in the project. This may result into rapid and fruitful developments in discoveries of the scientific treasures of Revelation.

Seventhly, by making IIOK a rigorous scientific research program, well situated within an international scientific umbrella, the chances of attracting more competent Muslim scholars to it will increase, as well as drawing the attention and getting respect from academic circles and institutions in the Muslim world who are currently rather skeptical about the endeavor.

Eighthly, the system strategy that will be summarized in chapter two shows clearly where the Islamic dimension can make a decisive difference in the whole enterprise of systemic integration of knowledge; i.e., via the "Guiding Framework".

Ninthly, since the utility of any science in real life situations is an integral part of any viable discipline these days, particularly in the system field, then integrating the Islamic dimension in the overall system framework will make real life practices an integral part of the development of any special hybrid sciences that may spring out of IIOK in the future. Usefulness is an Islamically required virtue of any knowledge, otherwise it will be classified as an undesirable knowledge.

2 - The Integrative Turn in Western Academia

“The 21st-century is a radically new era, unprecedented in human geo-history, marked by deep and complexly interrelated global crises: ecological, economic, political, moral, and existential, to name but some of pertinence. These complex problems or crises present extraordinary dangers and pitfalls, as well as great opportunities and potentials. Due to their profound interdependencies and feedback loops, these complex and intractable crises can best be understood as a singular socio-ecological crisis, or what we call the meta-crisis. Clearly, this meta-crisis is the most complex and urgent challenge of the 21st-century. It is a ubiquitous, real-world phenomenon, whose unprecedented complexity profoundly transcends the boundaries of our traditional academic disciplines and specialized research methodologies... Indeed, the meta-crisis is a complex, multifaceted totality which is far more complex than can adequately be addressed by piecemeal, mono-disciplinary approaches and methodologically restricted research programs. Such approaches fail to account for all its facets and their dynamic, non-linear interrelationships and are therefore incapable of providing adequate holistic accounts of the meta-crisis” (Hedlund et al - On the Deep need for Integrative Theory for the 21st Century-2015).

Comprehensive and sophisticated integrative frameworks (*metatheories*) are needed for three main reasons:

- 1 - Complex 21st-century problems and the meta-crisis, at large, demand frameworks that go beyond the proliferating fragmentation of knowledge and grasp the “big-picture”; that is, support us to effectively account for the intricate multidimensionality and dynamism of the meta-crisis, foster coordination and integration across disciplinary boundaries and knowledge domains, and ultimately help generate transformative praxis that can optimize the conditions for planetary flourishing.
- 2 - Integrative metatheory can serve a crucial emancipatory function by helping us to identify the real causes of social pathology, oppression, and alienation.

3 - To resolve the meta-crisis we need to expand the purview of our vision and imagination to develop ideas about what human beings are capable of and what are the conditions for their universal free flourishing; and metatheory is well placed to assist with this by articulating an integrated descriptive, normative, and aesthetic vision of a concrete exemplary world and a coherent program for global transformation in the coming decades. Without such a vision we cannot even see what kind of planetary society is possible.

The meta-crisis is not just multifaceted. There are many interconnected objective or exterior crises or wicked problems occurring (e.g., political, economic, and ecological). These interconnected crises are also situated in an intersubjective context of “interior” meaning making response that includes philosophical, scientific, religious, existential, worldview, and psychospiritual dimensions that are essential to include in an adequate understanding of the complex dynamics in play in order to facilitate more effective responses. In other words, what distinguishes the meta-crisis from the multi-crisis is that, while the latter highlights that there are many different crises occurring simultaneously and recognizes that many of these are interconnected, the former goes a step further and uses integrative metatheoretical frameworks and distinctions to reveal the subjective as well as objective, semiotic as well as “material”, “interior” as well as “exterior” dynamics in play.

Meta implies an overarching unity that holds and operates on the differences in their subjective as well as objective complexity. The notion of the meta-crisis thus challenges the idea of an exclusively technological set of solutions to our global challenges. This is because, in a context of generalized relations, both interpretation of the meta-crisis and possible responses to it will be contested. Thus, resolution of the meta-crisis will involve among other things *hermeneutic* hegemonic/counter-hegemonic struggles.

Metatheory is needed, among other things, to orient and support the coordination of these struggles globally. Its meta-view offers an integrated perspective of the human subject in relation to the world. Without it, we cannot even ‘see’ the multi-faceted crisis, let alone construe it adequately or relate to it effectively; with it, new realities and leverage points for impact are highlighted. Metatheories have co-evolved or co-emerged with the meta-crisis. On the one hand the meta-crisis demands and in part drives the emergence

of integrative metatheory, while on the other hand, integrative metatheories allow one to see and engage the meta-crisis in its full holistic complexity. They thus present us with unprecedented opportunities for helping to effect a transition to a new sustainable form of life. They can help empower us to make it through the collective rite of passage that the meta-crisis necessitates.

The world seems to be demanding transformation to new intellectual formations and structures of consciousness that can support new modes of praxis and engagement, suited to our contemporary context. Such formations can not only avert bio-catastrophe but also actualize the world's evolutionary potentials and profound opportunities for human development and spiritual maturation on the way to the emergence of a freely flourishing Earth community.

Integrative metatheory can contribute to a lifeworld transformation wherein a deeper understanding of who we are as a species and our place in the field of nature is cultivated. The way we understand ourselves in the world powerfully informs how we relate to and shape the world in and through the activities that reproduce or transform our social structures. That is, metatheories tend to undergird our collective modes of thought and vision around which we organize our societies. Metatheories can be viewed as the formalized intellectual expression and rationalization and/or reconstruction of larger cultural worldviews that echo social structures.

While there are some countervailing trends, much of the contemporary academy remains hypnotized by either the hyper-analytic, hyperspecialized, fragmented gaze of late modernity, or the sliding scale of postmodern relativism and its antipathy to integrated knowledge and meta-level understanding. Together these two orientations offer inadequate understanding(s) of our many complex problems and their root causes, let alone the socio-ecological crisis at large. Without being able to adequately illumine such root causes, the academy remains largely impotent to address and help transform them. This point is underscored by the fact that, to date, the dominant metatheories of modernity, such as positivism, have not only failed to alter fundamental trajectories of human-induced ecological degradation but are in fact deeply implicated as underlying causal forces contributing to such trends, as has been widely argued by philosophers and social theorists alike.

*“There are many important approaches that have contributed to the integration of knowledge in the face of widespread disciplinary and methodological fragmentation emerging across the planet. These include inter-, multi-, cross- trans, and mixed methods approaches. These integrative approaches are being developed within a single discipline or knowledge domain, or between a limited selection of them. A much smaller number of approaches attempt to “include” or encompass in some sense all the general domains of human knowledge – from the arts and humanities to the social and natural sciences. These are the ‘heavyweight’ integrative metatheories of our time: the philosophy of critical realism, founded by Roy Bhaskar (1944-2014); integral theory founded by Ken Wilber (1949-); and complex thought, founded by Edgar Morin (1921-). They represent some of the most advanced expressions of macro-level integrated knowledge that encompasses, and/or articulates an orienting metatheory for all domains of human inquiry”.*¹

One important point by which to conclude this brief section about the leading integrative metatheories and introduce the “integrative ontological turn” is that about ontological realism, a view introduced by the philosophy of critical realism. Ontological realism is the critical realist view that the object of inquiry is existentially intransitive in relation to the investigator and relatively or absolutely intransitive causally. Ontological comprehensiveness refers to the inclusion of all key dimensions, planes or contours of reality known to humans – including real generative mechanisms and structures in the subjective, social, and natural domains – in the purview of one’s metatheorizing. This does not necessarily mean that one is integrating theory from all of these domains per se, but rather that all these domains are considered and one’s metatheorizing situated within this context.

3 - The Integrative Turn in General Ontology

The epistemological questions such as “how we provide scientific knowledge” should not be prioritized over the investigations into the transcendently necessary conditions of science. It is the ontological question of “what the world must be like for science to be possible” that should be dwelt on. We should not confuse “what is” with “how we know,”. Idealists and empiricists reduce *reality* to our ideas and perceptions. All theoretical positions are dependent upon particular assumptions about *ontology* (theory of being:

1 - Hedlund et al- On the Deep need for Integrative Theory for the 21st Century-2015

what is the world made of? What objects do we study?), *epistemology* (theory of knowledge: how do we come to have knowledge of the world?), and *methodology* (theory of methods: what methods do we use to unearth data and evidence?).

Ontology does not have as its subject matter a world apart from that investigated by science. In as much as investigators in all branches of science are delving into the *composition, properties and change* of the *furniture of the world* ontology should become a *conceptual science* firmly grounded in and derived from current scientific knowledge about reality. What is involved here is the essential distinction between the *intransitive* (the object of scientific knowledge) and *transitive* (fallible scientific knowledge) dimensions of knowledge proposed by critical realists. The distinction between *intransitive* and *transitive* dimensions of science implies that the world should not be conflated with our experience of it. Only on the basis of such a realist point of view can there be room for factual error, that is, discrepancy between idea and fact.

Ontology itself should be kept distinct from the nature of the reality under investigation, because the latter is intransitive, while the specific ontological theories put forward by investigators are transitive. The term ontology refers to the *study or theory* of being, not to being itself. To have an ontology is to have a *theory* of what exists.

3.1 - Integrative General Scientific Ontology

I take the scientific ontology of Mario Bunge as loosely representative of the integrative ontology of the two metatheories of Integral Theory (IT) and Complex Thought (CT).

Mario Bunge defines ontology as “*the branch of philosophy that studies the most pervasive features of reality, such as real existence, change, time, causation, chance, life, mind, and society.*”² His views on ontology may be summarized as follows:

1. Ontology can be classed into “*general*” ontology and “*special*” ontology; the former studies all existents, and the latter addresses a certain genus of things or process such as those in physics, chemistry, biology and society.

2 - Bunge, Mario (1999). *Dictionary of philosophy*, Amherst: Prometheus Books.

2. It follows that “*general*” ontology probes into the concepts of time, space and event, and *social ontology* (as a special ontology) studies such general sociological concepts as *social system*, *social change*, *social relations* and *social structure*.

3. There are three approaches to the study of ontology: *Speculative ontology*, which may contain insights but is remote from scientific knowledge. *Exact ontology* draws explicit support from formal tools, but may neglect the philosophical tradition or contemporary scientific knowledge and thus become nothing short of applied logic. *Scientific ontology*, by contrast, is both exact and congruous with science. Logical or mathematical in form, it learns from formal and factual sciences, fixes unresolved problems, and poses new ones.

4. The significance of ontology lies in the facts that:

(a) all scientific research has to proceed by invoking some ontological hypotheses, e.g., “the world exists independently of the researcher”. Ontology can both facilitate and hinder interesting research questions and designs;

(b) every *worldview* and *ideology* are a combination of ontological and value systems. Therefore, after the advent of modern science, *scientific ontology* becomes all the more important because it makes nonscientific ontology obsolete.

5. Ontological statements, like scientific ones, are fallible. Ontological and scientific questions differ only in scope.

6. Formal sciences (logic, mathematics and semantics) study conceptual objects such as set and category, while factual sciences (natural and social science) and ontology deal with concrete objects. Therefore, ontology cannot be built merely on logic, since logic does not describe, represent or explain any factual items. However, any robust and exact ontology presupposes logic: deductive logic and pure mathematics are ontologically neutral, and hence instrumental in building ontological theories.

7. Scientific ontology deals only with the *real world* in light of the findings of science.

8. Scientific ontology has to start with the concepts of *things* and their *properties*. Furthermore, to be in line with contemporary science, it should regard concrete things as changeable, i.e., material or having energy.

9. The main objectives of scientific ontology are to analyze and to systematize the ontological categories and hypotheses fitting to science, and to clarify whatever idea science takes for granted or leaves in the twilight.

10. The two major families of ontology are *materialism* and *idealism*. Further distinctions can be made and primary among them is the distinction between the *static* and *dynamic* ontologies. The static ontology is characterized by the belief that change is only a momentary departure from equilibrium or harmony, which would be the ideal state of affairs. By contrast, the central thesis of the dynamical ontology is that stasis is a particular and ephemeral case of process: that every state of a thing is either the initial, intermediary or final phase of a process. All factual sciences focus attention on change or the laws/trends of change.

11. Like extremely general scientific theories, ontological theories cannot be tested directly, but should be tested through the checking of more special theories gotten from the general ones by conjoining them with subsidiary assumptions.

On the basis of the above ontological principles Bunge established a comprehensive, cogent and robust ontological system, which he called "*systemism*".

3.1.1 - General Characteristics of Bunge`s Ontological System

1. *Exact*: every concept used is exact or exactifiable;
2. *Systematic*: hypotheses or definitions belong to hypothetico-deductive systems;
3. *Scientific*: hypotheses are consistent with contemporary science;
4. *Materialist*: every entity is material (concrete), and every ideal object is ultimately a process in some brain or a class of brain processes;

5. *Dynamicist*: every entity undergoes changes;
6. *Systemist*: every entity is a system or a component of one or more systems;
7. *Emergentist*: every system possesses (emergent) properties that its components lack;
8. *Evolutionist*: every emergence is a stage in some evolutionary process.

Bunge's ontology is centered around "things" and "systems" rather than events, processes or facts. Such a system is science-oriented, not only compatible with but conducive to the development of contemporary science. When philosophers and social scientists choose facts, events or processes as their research objects, they tend to neglect that every fact involves some *concrete* or *material* thing in that the fact is the state or change of state of something. *Static* facts are things in a given state, while *kinetic* facts are changes of state of things. Swift changes can be called *events*; if prolonged, we may refer to them as *processes*. In other words, facts do not exist independently of things.

Bunge identifies *materiality* with *concreteness*. All things are material and thus concrete, and they may be imperceptible like an electron or biosphere, or tangible like a stone or a plant. He insists that there are no *properties* in themselves, because every concrete or substantial property, such as moving, reacting, or remembering, is the property of some thing or other – bodies, reactants, brains ...et cetera. One of the tasks of science is thus to *identify* and *interrelate* the properties that things possess, as well as the patterns of the associations and changes of these properties.

The distinction between *things* and *facts* are *analytical* rather than *ontological*, because there are neither states nor changes of state in themselves. Nor are there things that fail to be in some state or other, or that undergo no changes. It follows the question is not to choose between *ontology of facts* and *ontology of things*. Instead, it is necessary for any careful researcher to *combine* these two ontologies into one single *ontology of things involved in facts* or *of facts involving things*. As regards scientific research, the adoption of a thing-based ontology implies that the analysis of any fact should start by identifying the thing(s) involved, such as reagents in the case of a chemical reaction, and brains in that of a mental process.

Every object is either a material, concrete thing, or a conceptual construct, and none is both. Therefore, the three tenets of Bunge's emergentist materialism are:

(1) *the world is exclusively constituted by concrete/material things;*

(2) *conceptual (abstract) objects, such as diagrams, hypotheses or theories, do not exist independently of the brain(s) that figure them out;*

(3) *emergentist materialism is not to be confused with physicalism or vulgar materialism, since it leaves sufficient room for supra-physical things – characterized by emergent properties – such as organisms and social groups.*

All things undergo changes. Bunge adopts a broad concept of matter, pointing out that *x is material* is tantamount to *x has energy* and *x is changeable*. In other words, "change is universal ... Mutability is the one property shared by all concrete things, whether natural or artificial, physical or chemical, biological or social, perceptible or imperceptible". Shorter: *to be (material) is to become*. In contrast, *conceptual (abstract) objects* do not possess energy, undergoing no changes. What changes are not conceptual objects, but the material processes in the brain. When things interact intensively in a specific way, they *combine* into *novel systems*, namely, complex things structured in a definite (though not immutable) fashion. By contrast, *simple associations*, e.g., the formation of a sand pile or the coalescence of droplets, are not characterized by specific structures, but by a low degree of cohesiveness or lack of strong bonds, and thus may break up relatively more easily owing to internal rearrangement or external forces.

Complex combinations result in systems with *emergent properties* that are absent from its components. For example, a proton and an electron combine to yield a hydrogen atom; two hydrogen atoms combine to form a hydrogen molecule, and so on. These combined systems differ from mere aggregates (associations) in at least three respects:

(1) the original items alter in the process, so that they are precursors rather than constituents of the whole;

(2) combinations ... are more stable ... because they are more cohesive;

(3) combinations take more energy, longer time, or rarer circumstances, as the case may be.

Formally, a system is a complex object whose parts or components are held together by bonds of some kind. These bonds are logical in the case of a conceptual system, such as a theory; and they are material in the case of a concrete system, such as an atom, cell, immune system, family, or hospital. The collection of all such relations among a system's constituents is its structure (or organization, or architecture).

Depending on the system's constituents and the bonds among them, a concrete or material system may belong in either of the following levels: *physical, chemical, biological, social, and technological*. The *semiotic systems*, such as *texts and diagrams*, are *hybrid*, for they are composed of material signs or signals, some of which convey *semantic meanings* to their potential users. *Mechanisms* are involved in the communication of such systems.

Such an ontological system, which can be called *emergentist systemism*, rests on the following postulates:

1. Every object, whether material or conceptual, is either a system or an actual or potential component of one;
2. Every system, except the universe, is a *subsystem* of some other system;
3. Every system has *systemic (emergent) properties* that its components lack;
4. All things at each level are composed of things belonging to lower levels;
5. Every problem ought to be approached in a systemic (rather than sectoral) fashion;
6. Every idea ought to be put together into systems, preferably theories.

The *ultimate goal of theoretical research*, be it in philosophy, science, or mathematics, is the *construction of systems*, i.e., theories ... because the world itself is systemic, because no idea can become fully clear unless it is embedded in some system or other.

Events and processes are what happens in, to, or among *concrete systems*, while the process or processes that *make a concrete system tick* could be termed a *mechanism*. Consequently, to place systems theory on a firmer ontological footing, it is necessary to address a number of crucial aspects of a *System worldview*, such as the *components* of a system and *their interactions*, the *level structure of reality*, *emergence*, *mechanisms*, and so on.

3.1.2 - *Emergence and Convergence: the integration of knowledge*

According to Bunge:

“The term ‘*emergence*’ refers to the origin of novelties, as in the emergence of a plant out of a seed and the emergence of a visual pattern from the juxtaposition of the tiles in a mosaic. And the *convergence* ... is that between initially separate approaches and fields, as in the interdisciplinary studies of mental processes and of the creation and distribution of wealth.

At first sight *emergence* and *convergence* appear alien to each other, if only because, whereas the former is an ontological category, the latter is an epistemological one. On second thought they are not mutually alien, because the understanding of emergence often requires the convergence of two or more lines of research. Thus, the attempt to explain chemical reactions generated physical chemistry; the wish to understand speciation prompted the union of evolutionary and developmental biology; the urge to understand mental processes led to the merger of psychology with neuroscience and sociology; and the need to understand and control the distribution of wealth gave rise to socio-economics”.³

The two categories in question are intimately related. Indeed, some novelties result from the self-organization of a collection of disparate entities; and every merger of ideas involves the emergence of new ones – those that bridge the initially disconnected items. Thus, when two disciplines converge, a whole new inter-discipline emerges. And when a new broad viewpoint or approach emerges, some previously disconnected fields of inquiry are likely

3 - Bunge, M.: *Emergence and Convergence*; University of Toronto press (2003); USA.

to converge. Consequently, the widespread beliefs that emergence precludes convergence, and that emergence must be rejected because it is an obstacle to the unity of knowledge, are mistaken.

For instance, the scientific study of the origin of life requires a close collaboration of biology with chemistry and geology; the study of the relation between morbidity and mortality, on the one hand, and socio-economic status, on the other, is central to epidemiology and medical sociology; and the investigation of the links between big business and politics is crying for the emergence of econopolitology. In general, emergence calls for convergence because only multi-disciplinarity and interdisciplinarity can explain multifaceted and multilevel events. In turn, convergence requires the emergence of new bridge or glue concepts and hypotheses.

When it was realized that evolutionary novelties emerge in the course of individual development (ontogeny), it became clear that evolutionary biology must be amalgamated with developmental biology. Again, when it was found that mental processes, such as emotion, vision, speech, reasoning, and decision-making, are brain functions, it became obvious that psychology had to coalesce with neurobiology: this is how cognitive neuroscience was born. When it became clear that neither economics nor sociology by themselves can cope with such cross-disciplinary problems as income distribution and national development, socioeconomics emerged. Likewise, understanding the emergence and evolution of the state calls for a synthesis of anthropology, archaeology, sociology, economics, politology, and history.

3.1.2.1 - Ontological Emergence

Emergence happens every time something qualitatively new arises, as when a molecule, a star, a bio-species, a business, or a science is born. And it consists in a new complex object having properties that none of its constituents or precursors possess. As for cross-disciplinarity, or border trespassing, it has been a common enough research strategy in the sciences and technologies for nearly two centuries: think of physical chemistry, biochemistry, psychophysics, neurolinguistics, or medical sociology.

As a rule, wholes are not similar to their parts. Wholes possess properties that their parts lack. Such global properties are said to be emergent. The emergent

properties are not distributive but global. By distributive we mean that the property of a whole is distributed additively among its parts. These global (systemic) properties originate in the interrelations among the constituents of the systems concerned, e.g., the flow pattern of a river, the synchrony of a neuron assembly, the body plan of an organism, the self-regulation of an organism or a machine, the cohesion of a family, the organization of a business firm, the stability (or instability) of a government, the equilibrium (or disequilibrium) of a market, the division of labour in a factory or in a society, or the level of development attained by a nation.

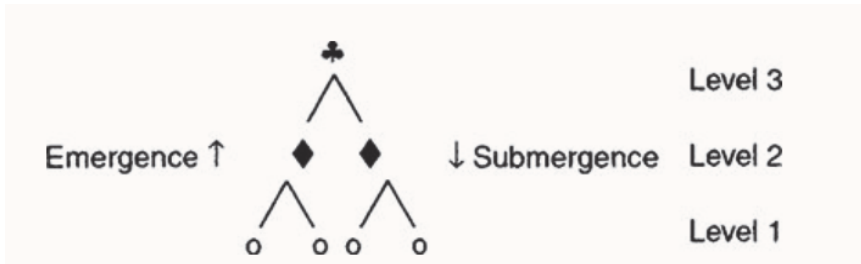
Two types of emergent must be distinguished: absolute and relative. The former are 'firsts': they refer to the earliest occurrence of individuals of a new kind, such as the very first bacterium that emerged on Earth about three billion years ago, the beginning of agriculture, the first car, or the first laboratory in history. This kind of emergence is different from later instances of the same kind, such as newly manufactured cars, which may be called 'relative' emergents. However, save when dealing explicitly with 'firsts', no distinction is drawn between absolute/relative.

Another distinction worth drawing is that between natural (spontaneous) and artificial (or made) assembly. The former is also called *self-assembly*. Examples: the solidification of a body of water; the formation of a group of cells that oscillate synchronically; and the coalescence of a street gang or a sports team around a task or a leader. By contrast, car assembly and personnel recruitment are artificial processes. But, of course, natural and artificial emergence can combine, as in the following familiar process:

Seed → Seedling → Sapling → Tree → Log → Pulp → Paper → Book

Bunge gives the following formal definition of emergence: To say that *P* is an *emergent* property of systems of kind *K* is short for '*P* is a global [or collective or non-distributive] property of a system of kind *K*, none of whose components or precursors possesses *P*.'

Fig 1: Emergence and submergence



Source: Bunge - Emergence and Convergence

Fig. 1 depicts a level by level self-assembly of a complex system from precursors. Every new level is constituted by combinations of lower-level things; every higher-level thing is characterized by emergent properties. On the other hand, as we go down the levels, we have the phenomenon of submergence where the upper system conditions its components such that they lose some of their properties in order to combine as elements in the higher-level system. No things, no properties thereof. Hence, to ask properly how properties emerge amounts to asking how things with emergent properties arise. In turn, this question boils down to the problem of emergence mechanisms.

A *level* is not a thing but a collection of things, namely the collection of all the things that have certain properties in common – such as the collection of all living things or the collection of all social systems. Level L_{n-1} precedes level L_n if every element of L_n is composed of entities of level L_{n-1} .

The concept of emergence combines two ideas: those of qualitative novelty and of its occurrence in the course of some process, such as freezing or evaporation, ontogeny or phylogeny, technological invention or social innovation. There is no emergence in itself or separate from emerging things: whatever emerges does so in some (complex) object. And there is no emergence *out of nothing*: everything emerges from something, such as interactions among either the constituents of a system or some of them and environmental items. Thus, refraction emerges in a medium from its interaction with light; and language emerges in the heads of toddlers interacting with other humans.

A new thing possessing an emergent property is sometimes called an *emergent*. And the process whereby a thing loses one or more properties may be called *submergence*. For example, a newly formed cell is an emergent, whereas cell death instantiates submergence. Other familiar examples are the formation and dismantling of a neuron assembly that occur in learning and forgetting something, as well as the organization and disintegration of a social system such as a firm. Any long-term history of a concrete thing, such as a developing organism or an evolving society, involves both the emergence of some properties and the submergence of others. The long-term history of a thing, then, can be characterized by the properties it gains together with those it loses.

The concept of emergence introduced above is ontological, not epistemological. Therefore, contrary to a widespread opinion, it has nothing to do with the possibility or impossibility of explaining qualitative novelty. Hence, it is mistaken to define an emergent property as a feature of a whole that cannot be explained in terms of the properties of its parts. Emergence is often intriguing but not mysterious: explained emergence is still emergence. Emergence processes are far more difficult to explain than are aggregation and dispersion processes.

Some of the most interesting and toughest problems, in any science, are to discover mechanisms of emergence and submergence. This is the task of figuring out and, if possible, effectively finding the processes that end up in the assembly (or the dismantling) of a system characterized by one or more emergent properties. Here are some examples of emergence mechanism challenges: What are the mechanisms causing the assembling of neurons into systems capable of perceiving a figure or uttering a word? How and why do people get together to push for or prevent a social reform? What has caused the recent decline of the family, both nuclear and extended, in so many advanced countries?

An adequate and general definition of the conditions for emergence is elusive, if not impossible, given the large variety of emergence mechanisms. Thus, we need different theories to account for widely different emergence mechanisms. This is why scientific explanations are specific: because mechanisms are specific. In other words, there are no all-encompassing explanations because there are no one-size-fits-all mechanisms. This alone should render the

universality claims of dialectical, psychoanalytic, natural selection, and rational-choice explanations suspect.

When a mechanism in a system is hypothesized and found, it can be claimed that the behaviour of the system in question has been explained. Otherwise, one only has either a description or a subsumption under a generalization. For example, to say that the vending machine dispensed a water bottle because a coin was inserted only describes superficially (functionally) the way the machine works. In general, input-output models and functional accounts are purely descriptive, and therefore shallow – descriptive rather than explanatory. Likewise, to say that so and so died of old age does not explain why he did not die a year earlier or a year later. A genuine explanation of life and its end, just like an explanation of the coin–water bottle correlation, requires hypothesizing mechanisms. Thus, to *explain* X is to propose the mechanism(s) that give(s) rise to (or else maintains or destroys) X. The detailed emergence mechanisms, whether physical, chemical, or biological, are specific. And as long as we do not understand or at least guess at such mechanisms, we cannot claim to understand anything about the corresponding processes.

As a summary, the first methodological maxim we learn is, *Analyze!* The second is, *Synthesize!* This is because, to understand how a complex item works, we must first decompose it, and then connect its parts and place the whole in a wider context. In addition, the world is made up of interconnected systems. If the world were just a pile of items, analysis would suffice; and if it were a solid block, only the pre-analytic intuition of the whole could help. Fruitful methodology follows, inspires, and checks ontology.

System emergence

There are two ways a whole may come into being: by *association* or by *combination*. The accretion of dust particles and the coalescence of droplets exemplify association; so, do the formation of garbage dumps, water pools, sand dunes, clouds, crowds, and columns of refugees fleeing from a disaster. What characterizes all of these wholes is the lack of a specific structure constituted by strong bonds: such wholes are neither cohesive nor, consequently, lasting. However, when an accretion process keeps going beyond a certain threshold, it can give rise to qualitatively new things, as in the sequence: Cotton wool → Thread → Fabric → Dress.

When two or more things get together by interacting strongly in a specific way, they constitute a system. This is a complex thing possessing a definite structure. Atomic nuclei, atoms, molecules, crystals, organelles, cells, organs, multicellular organisms, bio-populations, ecosystems, human families, business enterprises, and other organizations are systems. They may all be said to emerge through combination or self-organization rather than aggregation – even though, once generated, some of them may grow by accretion or decline by attrition.

What holds for things also holds, *mutatis mutandis*, for events (changes of state) and processes (sequences of states). For example, random molecular movements aggregate into macro-physical regularities; likewise, some of the actions of mutually independent persons give rise to social statistical regularities – for instance, average numbers of marriages, accidents, and suicides. Unlike mere aggregates, systems are more or less cohesive. However, they may break down either as a result of conflicting relations among their parts or in response to external forces. That is, a system may end up as an aggregate and conversely.

The concept of a system is bound to occur in the very statement of any scientific problem dealing with wholes of some kind. Contrary to the methodological-individualist prescription, one starts with the system, though not as a sealed unit but as a complex thing made up of distinct interacting constituents. In accounting for the emergence and dismantling of aggregates, we focus on their composition and environment, in particular the external stimuli that favour the aggregation (or the dispersion) process. In this case structure matters little: a heap does not cease to be a heap if its constituents exchange places. Therefore, basically we explain aggregates (and their dispersion) in terms of their composition and environment. By contrast, structure, in particular internal structure, is essential to systems. Indeed, to account for the emergence of a system we must uncover the corresponding combination or assembly process and, in particular, the bonds or links resulting in the formation of the whole. The same holds for any account of a system's breakdown.

We explain the emergence, behaviour, and dismantling of systems in terms not only of their composition and environment, but also of their total (internal and external) structure. Nor is this enough: we should also know something

about the system’s mechanism: that is, what process makes it behave – or cease to behave – the way it does. A way to find out the mechanism that makes a system tick is to look for the specific functions of the system – that is, which processes are peculiar to it. We define a mechanism as a process necessary for the emergence of either a property or another process – the specific function (Fig. 2).

Fig 2: Specific function

System	Specific function	Mechanism(s)
River	Drainage	Water flow
Chemical reactor	Emergence of new molecules	Chemical reactions
Organism	Maintenance	Metabolism
Heart	Blood pumping	Contraction-relaxation
Brain	Behaviour and mentation	Interneuronal bonds
Time piece	Time-keeping	Several
School	Learning	Teaching, study, discussion
Factory	Production of merchandise	Work, management
Shop	Distribution of merchandise	Trade
Scientific laboratory	Growth of knowledge	Research
Scholarly community	Quality control	Peer review
Courthouse	Seeking justice	Litigation
NGO	Public service	Voluntary work

Source: Bunge - emergence and convergence

In some cases, a given specific function can be accomplished by systems with different mechanisms. In these cases, the systems in question can be said to be *functionally equivalent*. For example, transportation can be effected by car, ship, or plane; some computations can be carried out by either brains or computers; and the redress of grievances can be sought by collective bargaining, litigation, violence, or bribing. To find the function given the mechanism is a direct problem. By contrast, going from function to mechanism is to work on an

inverse problem – one that, if soluble at all, has more than one solution given that the functions-mechanisms map is one-to-many.

Submergence: System Dismantling

The loss of higher-level properties may be called *submergence*. Since properties have no independent existence, but are possessed by things, property submergence is just a feature of the (partial or total) dismantling of systems of some kind. For example, it occurs when a molecule dissociates into its atomic precursors, and when the members of a family or a political party disband.

Only physicists, chemists, and engineers have studied intensively submergence processes, such as ionization, nuclear fission, chemical dissociation, and the breakdown of solids. Biologists have started recently to deepen their understanding of the aging and death mechanisms, such as oxidation, telomere shortening, unrepaired damage, and programmed cell death. So far, social scientists have only been fascinated by a few very largescale spectacular dismantling processes, notably the fall of the Roman Empire and the French Revolution. The dismantling of the Soviet Empire took them all by surprise, and has not yet been satisfactorily explained. This may be due to the adoption, by social scientists, of sectoral approaches (purely economic, political, or cultural) to what was actually a systemic crisis that had been brewing over several decades. One of the features of the collapse of the so-called Socialist camp is the submergence of the legal and moral order. All of a sudden millions of people accustomed to being told what to do were left to fend for themselves, and in particular to invent and try out new social and moral norms in a normative vacuum.

Philosophers will not remain satisfied with examples of system dismantling: they will seek general patterns. However, there is but one general dismantling mechanism, namely the weakening of the internal bonds that hold the system together. Such weakening can happen in various ways. The most common of them is the intrusion of an external agent, e.g., adultery within a family system and usury within a rural social system. In sum, to understand the dismantling of a system we must understand the bonds that gave rise to it and have held it together. Shorter: Emergence explains submergence.

System Types:

- 1- *Natural*, such as a molecule, a river network, or a nervous system
- 2- *Social*, such as a family, a school, or a linguistic community
- 3- *Technical*, such as a machine, a TV network, or a high-tech hospital
- 4- *Conceptual*, such as a classification, a hypothetico-deductive system (theory), or a legal code
- 5- *Semiotic*, such as a language, a musical score, or a blueprint for a building

Note the following points. *First*, this typology belongs in an emergentist (or non-reductionist) materialist ontology. It makes no sense in alternative ontologies. In particular, it is as unacceptable to idealism as it is to vulgar materialism.

Second, this typology is not a partition, let alone a classification, because **(a)** most social systems are artificial as well as social: think of schools, businesses, or armies; **(b)** some social systems, such as farms and factories, contain not only people but also animals, plants, or machines; **(c)** all semiotic systems, even the natural languages, are artefacts, some of which – such as scientific formulas and diagrams – designate conceptual systems; and **(d)** activities in all social systems involve the use of semiotic systems. Still, the above typology does represent in a rough manner some salient objective features of the systems that compose the world.

Quick definitions of the above five concepts:

Definition-1: A *natural* system is one all of whose components, and the bonds among them, belong in nature (i.e., are not man-made).

Definition-2: A *social* system is one some of whose components are conspecific animals, and others are artefacts (inanimate like tools or living like domestic animals).

Definition-3: A *technical* system is one constructed by people with technical knowledge.

Definition-4: A *conceptual* system is one composed of concepts.

Definition-5: A semiotic system is one composed of artificial signs (such as words, musical notes, and figures).

Definition-6: An artificial system is one some of whose components are made.

The class of artificial systems equals the union of technical, conceptual, and semiotic systems, as well as the formal social organizations, such as schools, business firms, and governments. All languages are artificial in being made. The difference between 'natural' languages, such as English, and 'artificial languages,' such as predicate logic (when used as a language, not as a calculus), is that the latter are designed instead of evolving more or less spontaneously.

The Level Structure of the World

In any given system (molecule, organism, family, school, factory, etc.), at least two levels can be discerned: the *macro* and the *micro*:

The macro-level is the kind itself, that is, the collection of all the systems sharing certain peculiar properties. The corresponding microlevel is the collection of all the components of the systems in question. There may be more than one micro-level. For example, the atomic level is the collection of all atoms, while the molecular level is that of all molecules. Generally speaking, an n-th level system is composed of things on level n-1. The individuals may be the components of several types of systems, such as the family, school, or firm. And the individuals are in turn composed of subsystems like the central nervous system.

It is of crucial importance to recognize that all factual sciences are confronted with the problem of micro-macro linkage, because all of them study systems, and all systems under investigation have components (the micro-aspect) as well as systemic, emergent properties (the macro-aspect). Equally important is that *levels are collections of things*, and hence are concepts, not concrete things. Therefore, levels cannot act upon one another. In particular, the expression '*micro-macro interaction*' ... does not denote an interaction between micro and macro levels but an interaction between entities belonging to a micro-level and entities belonging to a macro-level.

An ontological hypothesis involved in and encouraged by modern science is that reality, such as known to us today, is not a solid homogeneous block

but is divided into several levels, or sectors, each characterized by a set of properties and laws of its own. A second, related presupposition is that *the higher levels are rooted in the lower ones, both diachronically and synchronically*: that is, the higher levels are not *autonomous* but depend for their existence on the subsistence of the lower levels, and they have emerged in the course of time from the lower in a number of evolutionary processes. This rooting of the higher is the objective basis of the possibility of partially explaining the higher in terms of the lower or conversely.

One lesson to be learned from all this is that, while the various sciences do occupy different levels, they form part of a single connected structure. The unity of that structure is cemented by the relations among the parts. A science at a given level encompasses the laws of a less fundamental science at a level above. But the latter, being more special, requires further information in addition to the laws of the former. At each level there are laws to be discovered, important in their own right. The enterprise of science involves investigating those laws at all levels, while also working, from the top down and from the bottom up, to build staircases between them.

The above can be summarized as follows:

1. The world can be construed as a level structure. That is, things group into levels of organization. Every real (material) existent belongs to at least one level of that structure. At least five qualitatively different levels of entity may be distinguished: *physical, chemical, biological, social and technical*. Every level may in turn be subdivided into as many sublevels as needed. For example, the *biological level* may be split into at least seven sublevels: *cell, organ, organ system, multicellular organism, bio-population, ecosystem, and biosphere*.
2. A level is a *collection of things* sharing a cluster of properties and relations among one another. In other words, it should be kept in mind that levels are *concepts* instead of concrete things.
3. Every concrete thing (system) on any given level is composed of lower-level things (systems), and is characterized by emergent properties absent from these components.

4. The systems on every level have emerged in the course of some *process of assembly* of lower-level entities.
5. All processes of assembly are accompanied by the *emergence* of novel properties and the *submergence* of others. For example; the social level is composed of humans but is not an organism itself.
6. The process of assembly can happen either spontaneously (naturally, such as biological and cultural evolution) or artificially (man-made or man-guided, such as that in a laboratory). Such a process is one of self-organization if and only if the resulting system is composed of subsystems that are not in existence before the very process, e.g., the formation of an embryo's organs.
7. Every level, both of the world and of science, has autonomy and stability to some degree.
8. The level structure of the world is far from being static but changes over time, tending to become more complex.

The above ontological description of levels has the following epistemological and methodological implications:

1. Begin by studying the class of facts that concern us on their own level(s), and introduce further levels as required.
2. Do not skip levels.
3. When investigating inter-level relations, do not ignore the intermediate levels and sublevels, if any.
4. Try to explain emergence while acknowledging the ontological novelty at every level. Reduction is desirable and fruitful in scientific research, but reduction does not imply levelling: it relates levels instead of denying that they exist. Reduction, then, is a theoretical question that does not alter the level structure of the world.
5. Try to investigate the *genealogy* of emergent higher levels, since material emergence is emergence from precursors.

6. Try to integrate all the fields of knowledge that study the same objects.

The following should be considered in substantive research:

1. How individuals interact (micro-micro);
2. How they combine to form systems with emergent properties (micro-macro);
3. How (being part of) a system influences the individual component (macro-micro);
4. How systems interact and affect one another (macro-macro);
5. How individuals affect the system, which in turn exerts influences on the individuals (micro-macro-micro);
6. What the impacts the system has on individuals, the resultant actions of which in turn bear on the system itself (macro-micro-macro).

3.1.2.2 - *Convergence (Integration of knowledge)*

The convergence of disciplines can be either horizontal or vertical. The former occurs when two or more disciplines merge on an equal footing, as in the cases of cognitive neuroscience and socio-economics. In contradistinction, vertical emergence is the subordination or reduction of one discipline to another, as in the case of the reduction of thermodynamics to statistical mechanics.

In turn, there are two kinds of reduction: downwards and upwards, or micro-reduction and macro-reduction respectively. Whereas micro-reduction is analysis or decomposition of wholes into their parts, macro-reduction is synthesis or aggregation of individuals into wholes. And reductionism is of course the methodological doctrine that recommends reduction as the only way to understanding. Micro-reductionism is the methodological partner of individualism, while macro-reductionism is that of holism. Let us concentrate on the former because it is the most popular.

If everything is either an individual or a mere collection of individuals, then

the understanding of a whole is only brought about by diving down to the very bottom of things – that is, by identifying the ultimate constituents. Thus, light beams will be understood in terms of photons; atoms in terms of elementary particles; cells in terms of organelles and their components; multicellular organisms in terms of cells; social groups in terms of persons; propositions in terms of concepts; texts in terms of sentences – and so on. In short, micro would explain macro without further bother about details.

The sensational success of micro-reduction in modern science has given the impression that the concepts of scientific method and reduction are coextensive: that to conduct scientific research is basically to try and reduce wholes to their parts. The success of micro-reduction has obscured the fact that in most cases it has been partial rather than total. There are two main reasons for such limitation. The first is that a system, such as an atom, a cell, or a family, has a structure as well as a composition. In other words, an integrated whole is not just a collection of basic entities: it is a new entity with emergent properties of its own.

The second reason for the limitation of micro-reduction is that reference to the environment of the thing of interest is unavoidable, and the environment belongs to a higher-order level than the thing in question. This holds for physical atoms as well as for social atoms. Indeed, a well-posed problem in atomic physics or in field physics includes the boundary conditions, which constitute an abbreviated description of the macro-physical environment. Likewise, a well-posed problem in psychology or in social science includes explicit reference to the macrosocial environment, in particular the embedding system or supersystem.

Reduction is a strategy for coping with the bewildering diversity of reality and the concomitant diversity of the sciences of reality. Yet, for better or for worse, reduction has failed more often than it has triumphed, largely because it has denied emergence. In the domain of the social sciences integration is more fertile than any attempted reduction.

Why Integration Succeeds in Social Studies

The social studies are notoriously fragmented. For example, the typical economist does not listen to demographers; political scientists are rarely

interested in cultural studies; and most students in the field of cultural studies pay no attention to economics. Worse, every discipline is divided into equally isolated subdisciplines. For example, educational sociology is usually pursued independently from economics and politology; and the study of social inequality, gender discrimination, and racism are ordinarily disjunct from political science and the sociology of religion.

Such fragmentation is artificial and an obstacle to the advancement of knowledge because all of the students of society are expected to describe and explain social facts, and every social fact is likely to have multiple aspects – biological, economic, political, and cultural. For example, where land is scarce, population growth worsens such scarcity; and this event is in turn likely to trigger violence, with its biological, political, and cultural concomitants. Given the multifaceted nature of social events, the interdisciplinary barriers would seem to stem at best from differences in emphasis, at worst from tunnel vision or turf protection.

The frontiers in question are not only artificial. They are also deplorable, because they split systemic problems, such as those of the excessive concentration of wealth and power; they also block the flow of ideas, data, and methods that could be used in more than one discipline. For example, they discourage the investigation of socio-economic features such as income distribution; of biosocial ties such as the association between morbidity and income; and of economico-politico-cultural ones such as the business-politics, and religion-politics connections. After all, all of the social sciences are interested in the same subject: the past, present, and future actions of people.

The policy-makers, legislators, and public servants who overlook such ties among different aspects of social life are unlikely to help solve any sizeable social issues. For example, one of the main causes of underdevelopment is extreme concentration of economic and political power; a deficient healthcare system maintains high morbidity, which is detrimental to both learning and productivity; and both religious fundamentalism and terrorism are bound to flourish in economically depressed and politically oppressed regions. Given the many causes of underdevelopment, any sectoral approach to this problem is bound to fail. To generalize: Fragmentation leads to theoretical shallowness, which in turn hampers social progress.

If the fragmentation of the social sciences and technologies is both artificial and harmful, it should be overcome. But how? That is, how can the social sciences be unified without loss of depth, diversity, and rigour? Reduction cannot be the answer because it has been tried without success. And the answer to this question should suggest an alternative strategy, which is *cross-disciplinarity*. Social studies ought to be cross-disciplinary because all social facts, particularly if macrosocial, are multidimensional. More precisely, these facts have at once biopsychological, economic, political, and cultural aspects as well as environmental causes and effects. If this is true, then the right research strategy is integration or cross-disciplinarity rather than reduction. To put it in metaphorical terms: To explain a social fact we must look not only underneath and above it, but also around it. And such contextualization requires the intervention of additional disciplines. Shorter: Emergence calls for convergence.

2.2 - Integrative Philosophical Ontology

What follows is a brief summary of the ontological position of Critical Realism expounded by Dominic Holland (2014) as a rationale for “Integrating Knowledge Through Interdisciplinary Research”.⁴

2.2.1 - The Ontology of Critical Realism

For most of the twentieth century, mainstream philosophy of science – in its positivist and interpretivist guises – had been concerned largely with questions of epistemology. However, the accumulation of intellectual anomalies and antinomies arising from the development of orthodox positivist philosophy, principally those relating to the monistic account of scientific development and the deductivist theory of scientific structure, paved the way for a fundamental reorientation of the philosophy of science, from questions about how knowledge is possible to ontological questions about what must be the case for particular forms of knowledge to be possible.

Critical realists argue that reality has an “ontological depth” that can be understood as three overlapping domains, which reflect the vertical dimension, or *stratification*, of reality. The domain of the ‘*real*’ embraces the structures and

4 - Holland, D.- Integrating Knowledge Through Interdisciplinary Research (2014); Routledge- New York.

mechanisms that generate actual events and states of affairs, which we may experience in different ways and which we may not experience at all. The domain of the '*actual*', which embraces the events and states of affairs we may or may not experience, is therefore a subset of the '*real*', and the domain of the '*empirical*', which embraces what we do experience is therefore a subset of the '*actual*'. But, in addition to the vertical dimension of reality, there is also an equally important horizontal dimension.

The nature of some structures and mechanisms may be such that they can be isolated from their structural context by means of scientific experimentation. Activating the mechanism in a closed system will generate a regular pattern of events that will be the empirical ground for the identification of the mechanism as a real object. However, in the absence of human intervention in the causal order of nature, events and states of affairs will be generated by a multiplicity of different mechanisms (physical, chemical, biological, social, etc.) in what is known as an 'open system', so that the effect of the operation of one mechanism may not be manifest as an empirical regularity if, say, its operation is counteracted by the effects of the operation of another mechanism.

The possibility of differentiating between open and closed systems, therefore, presupposes the second feature of ontological depth – the *transfactuality* of generative objects – that is, their existence independent of any particular sequence or pattern of events detected empirically. It follows that causal laws refer not to patterns of events detected at the level of the empirical but to the operation of structures and mechanisms at the level of the real and that these must be analyzed, not as regularities but as tendencies.

Thus, we can make sense of the human intervention in nature required to produce a constant conjunction of events and state of affairs only if we assume that there is both vertical and horizontal ontological depth. Because the constant conjunction we produce is the empirical ground for the existence of a structure we have not produced, if we take constant conjunctions as given, as positivists do, we inevitably commit ourselves to the absurdity that, in scientific experiments, we are producing, rather than discovering the laws of nature and, furthermore, we become unable to explain how we manage to apply our knowledge of nature in technological achievements.

Similarly, if we are to make sense of the possibility of social practices, we must assume that society also has both vertical and horizontal depth. Social structures and casual mechanisms are the pre-existing and necessary conditions for the exercise of human agency but they exist only by virtue of human agency (which both reproduces and transforms them). Indeed, scientific inquiry (of which laboratory experimentation is but one aspect) is no different from any other social practice in this respect, for the production of knowledge would simply be impossible in the absence of a pre-existing social context.

The interpretivist tradition, in assuming that social reality is entirely a construction of thought and discourse, once again denies the possibility of ontological depth and becomes embroiled in judgmental relativism. In other words, the interpretivist tradition denies the existence of a realm of social objects, which have causal powers and liabilities which are *real* and of which we can have fallible knowledge *through* thought and discourse. The interpretivist tradition, then, in presupposing an ontology of empirical (and conceptual) realism, is unable to make sense of scientific – indeed, more generally, social – conflict, just as the positivist tradition is unable to do.

The possibility of scientific conflict, which presupposes the possibility of intellectual error, points to the third feature of ontological depth: *intransitivity*. Critical realists argue that we need to distinguish clearly between the intransitive domain of science (which encompasses the objects of inquiry) and the transitive domain (which encompasses our knowledge of those objects); for, only if we see thought as contained within, yet emergent and so distinct from, being can we make sense of the possibility of changing knowledge of an unchanging reality, and so of reconciling epistemic relativism and fallibilism with judgmental rationalism (that is, rationally comparing rival theories).

But, in collapsing the distinction between thought and being, positivism and interpretivism entail a series of related philosophical mistakes: the *empirical fallacy*, or the reduction of events and states of affairs to our experiences of them, which contains within it the *actualist fallacy* or the reduction of causal laws to constant conjunctions of events and states of affairs and which implies that statements about being can be reduced to statements about our knowledge of being – that is, the *epistemic fallacy*. The epistemic and actualist fallacies, in

turn, presuppose and are presupposed by the *ontic fallacy* or the reduction of knowledge to natural, which implies that our knowledge of being can be reduced to being alone.

But, if what exists is equivalent to what we can know, not only must knowledge determine being but being must also determine knowledge. Hence, we can speak of the *epistemic-ontic fallacy*, which in the social domain also entails the *linguistic fallacy* or the reduction of being to our discourse about being and which is underpinned by a more fundamental error, the *anthropic fallacy* or the reduction of being to *human* being.

In turn, these errors support and are supported by a range of additional, more specific, errors. Thus, in assuming that scientific inquiry is limited to the passive recording of naturally occurring atomistic events and states of affairs, we are effectively assuming that knowledge is accumulated gradually; that is, that science is monistic in its development, that it has certain foundations (in sensory experience) and that it is absolute (since there is nothing more to do than record a scientific fact accurately). In other words, in treating facts as things, we reify, naturalize and eternalize science and turn it into an asocial (and atheoretical) process.

2.2.2 - CR Ontological Rationale for Integrating Knowledge

Methodological diversity and similarity in science implies ontological diversity and similarity. Clearly, then, we need to develop an ontological framework that can show that it is by virtue of the similarities of the properties of different objects of inquiry that the integration of knowledge from specialized sciences is possible and that it is by virtue of the differences in the properties of similar objects that specialized modes of inquiry are possible. Critical realism offers such a framework; that the concepts of vertical and horizontal ontological depth and the concepts of stratification (through emergence) and transfactuality (through differentiation) deriving from them can justify scientific differentiation and integration.

Stratification of reality: From the practical successes of science that the logic of scientific discovery is characteristically open ended, in the sense that it involves a continual backwards movement in which structures and causal mechanisms lying at successively deeper layers or strata of reality are

discovered. Hence, once one set of objects lying at one level of reality has been identified and shown to explain objects lying at a higher level, it in turn becomes something to be explained at a lower level. An example of this process is the 'historical development of chemistry', which has involved the discovery of structures and causal mechanisms lying at progressively lower levels of reality. However, social entities are an exception in the sense that they are both ontologically higher than what they presuppose – that is, human agency –*and* epistemologically higher, because knowledge of social forms can come about only through the prior conceptualization of human agency.

How exactly, then, are the strata of reality related? Critical realists argue that, if one stratum is to explain another stratum without explaining it away, each stratum must be rooted in, emergent from, and so irreducible to and unpredictable from, the one below it. Let us consider this idea in more detail because it is the concept of emergence that gives us a way of understanding how levels of reality may be both differentiated and interconnected and hence how the sciences may be both differentiated and interconnected.

The concept of emergence is inherently compositional. By this is meant that any higher-level entity (and its emergent properties) is dependent upon a collection of lower-level entities in the sense that (a) they are the necessary component parts of the higher-level entity; (b) the emergent property is dependent upon (but not eliminatively reducible to) the properties of these parts; and (c) the emergent property, in the sense of a power or tendency, is not dependent upon the properties of other entities that are not such parts (although it may be so dependent for its realization). Consider the following example of a water molecule:

A water molecule can be considered to be a higher-level entity in the sense that its lower-level parts are hydrogen and oxygen atoms, which, in turn, can be considered to be higher-level entities in the sense that *their* lower-level parts are electrons, protons and neutrons. However, it is crucial to recognize that it is only from a *particular structure* of hydrogen and oxygen atoms that water (or hydrogen oxide) emerges (just as it is only from particular organizations of electrons, protons and neutrons that oxygen and hydrogen atoms emerge). Chemical bonding is the mechanism that describes the way the structure of oxygen and hydrogen atoms work, such that the water molecule possesses

properties, that is, causal powers and liabilities, dependent on, yet irreducible to, the properties of hydrogen and oxygen.

Hence, it is the fact that hydrogen and oxygen atoms have the power to combine in a certain way – that is, that they can form covalent bonds – that explains why hydrogen oxide (water) possesses its own set of causal powers and liabilities, such as solvency, electrical conductivity, non-combustibility, and so forth. But the properties of water could not have been predicted from knowledge of the properties of oxygen and hydrogen considered separately because oxygen and hydrogen – as gases, for example – are highly combustible whereas water, in any state, is not. In short, the properties of water amount to something more than the sum of the properties of its parts.

Emergence could also have a causal dimension beside the compositional one mentioned above. The synchronic relationship between two adjacent strata of reality can involve causation as well as composition. Consider again the emergence of water. The conditions for the emergence of water, as we saw above, are oxygen and hydrogen gases, a stimulus that causes them to react and ambient conditions. If the two gases react successfully, water molecules will form; in other words, the oxygen and hydrogen atoms will bond together in a particular arrangement. The oxygen and hydrogen atoms had to possess the property that they could combine – the property they possess in virtue of their sub-atomic structure. However, when this causal power is activated in a reaction such that chemical bonding occurs, it does not stop operating after bonding is complete. Even though a new substance that possesses its own causal powers and liabilities has emerged, the combining power of the oxygen and hydrogen atoms continues to be exercised; that is, the oxygen and hydrogen atoms continue to be attracted to each other. What has happened is that the properties of the hydrogen and oxygen atoms have changed. Before they react with each other, they are highly unstable so that, as gases, they are combustible but, after they react, they become stable so that, as the components of water, they are no longer combustible. Yet, the oxygen and hydrogen atoms still possess the power to combine, which must continue to be exercised if water is to exist.

Given the above reasoning we can now say that an emergent property pertaining to a higher-level entity is caused by the emergent properties of

its lower-level parts. But there will also be additional causal conditions that bring the new entity into existence and that allow the new entity to continue to exist; the “synchronic” dimension of emergence. Therefore, we need no longer restrict the meaning of “cause” to diachronic accounts of emergence; causation is involved in the emergence of entities, whether we analyze this phenomenon from either a synchronic or a diachronic perspective.

Reality consists of partially interconnected hierarchies of levels, in which any element *e* at a level *L* is in principle subject to the possibilities of causal determination by and of higher-order, lower-order and extra-order (extraneous) effects, besides those defining it as an element of *L* (including those individuating it as an *e*). The concept of “causal determination” is crucial to understanding both the differentiation and interconnection of objects of scientific inquiry. In the light of the theory of emergence outlined above causal determination can be thought of as encompassing two distinct types of causal process. The **first** type can be called *causal interdependence*, which refers to the internal relationship between causal objects lying at: (a) different yet adjacent levels of reality; and (b) the same level of reality. Consider, as an example, the emergent entity, water. The oxygen and hydrogen atoms of which water is composed are subject to lower-order determination by sub-atomic particles and are subject to higher-order determination by their very arrangement or structure, which is what gives rise to water.

The fact that the causal powers of oxygen and hydrogen atoms are modified by the structure in which they are arranged means that there is *intra*-order causal determination – that is, an internal relationship between causal objects lying at the same level of reality (because the oxygen and hydrogen atoms mutually determine each other) and that there is *inter*-order causal determination – that is, an internal relationship between causal objects lying at different yet adjacent levels of reality (because the causal powers of water depend on the exercise of the modified causal powers of oxygen and hydrogen and *vice versa*). Similarly, if we move down a level, we can see that the higher-level, modified causal powers of oxygen and hydrogen depend on the lower-level modified causal powers of sub-atomic particles and, *vice versa*, that the sub-atomic particles mutually determine each other.

We also find causal interdependence when we consider the relationship between social structure and human agency. By virtue of their biological constitution, people possess causal powers and liabilities – what we call human agency. But the fact that the causal powers which people possess are modified by the structure of which they are part means that the (modified) causal powers of human agents – the lower-level parts – depend on the causal powers of social structure – the higher-level entity; while the causal powers of social structure depend on the causal powers of human agents because it is only by virtue of the particular way in which people are related that a higher-level entity – that is, social structure – emerges.

The concept of causal interdependence, therefore, describes the internal relationship between different causal objects. It involves both inter-order causal determination – that is, causal determination between entities lying at different yet adjacent levels of reality – and *intra-order* causal determination – that is, causal determination between entities lying at the same level of reality. In short, causal interdependence may have a vertical as well as a horizontal dimension.

The **second** type of causal process can be called *causal influence*, which refers to the external relationship between causal objects lying at any level of reality and their environment. The colour of a chameleon is an example of this sort of causal determination. Although the colour of a chameleon is a biological property, it is nevertheless affected by environmental influences, some of which could be social. This is an example, not of causal interdependence but of causal influence, because the environmental mechanisms are not emergent from chameleons.

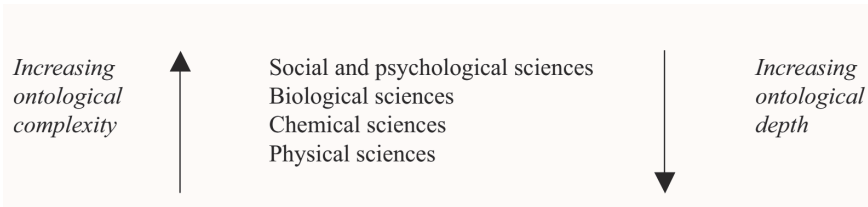
The concept of causal determination is different from the concept of ontological dependence, which refers to the way in which the existence of a given entity at a given level of reality presupposes the existence of all the entities lying in the strata below it. But, the concept of ontological dependence involves a one-way relation of necessity, because the entities lying at a given level do not depend for their existence on higher-order entities – only on lower-order entities. This does not contradict the concept of causal interdependence. When we examine entities at a given level of reality, either we can look at how they become the parts of higher-order emergent entities– that is, by considering

how their causal powers and liabilities are modified through the principle of multiple causal determination – or we can treat the entities at our chosen level as wholes – that is, in abstraction from any entities they may constitute as parts – and ask what must be the conditions of their existence.

A refined theory of integrative pluralism, therefore, offers us a way of understanding how it is that the sciences can be different yet still connected. Reductionism is an untenable thesis because, given the stratification of reality, it is impossible to explain the nature of an emergent entity solely in terms of the properties of more fundamental entities and to deny its status as a causal object in its own right. For example, we cannot explain why water extinguishes fire by referring only to the properties of hydrogen and oxygen, because these elements, when they exist as gases, are combustible; we have to refer to the properties of the water molecule as a particular chemical structure possessing properties – such as non-flammability – distinct from those of oxygen and hydrogen.

For the same reason, eclecticism is untenable. If the levels of reality were completely unconnected, so that we could not in fact talk of a hierarchy of ‘levels’, scientists would not be able to explain the properties of one entity (the whole) as the outcome of the operation of the properties of another set of entities (the parts). In other words, the historical pattern of discovery in science as one of increasing ontological depth would not make sense, if reality were simply a random flux of diverse things having no relationship to each other. We can represent the stratification of the sciences as shown in Fig. 3.

Fig 3: Stratification of the sciences



A movement down the ladder of the sciences in Fig. 3 represents an increase in ontological depth as scientists discover entities lying at successively deeper

levels of reality, whereas a movement up the ladder represents an increase in ontological complexity, in the sense that entities higher up ontologically presuppose a greater range of types of causal mechanism. Thus, social structures and mechanisms are governed not only by biological but also by chemical and physical mechanisms. We can now appreciate why many concrete entities – such as people – are so complex; for a person is not only a structured entity but also a ‘laminated system’ – that is, an entity whose elements are necessarily bonded by an irreducible plurality of structures.

Fig. 3 is a highly simplified representation of the stratification of the sciences. It must be recognized, for example, that there is stratification within each science as well as between sciences. Thus, the chemical sciences will reflect more than one level of reality – as the subdivisions of biochemistry and physical chemistry demonstrate. Similarly, each of the subdivisions within the ‘biological sciences’ – molecular biology, cell biology, physiology, anatomy, and so on – deals with a different level of reality.

What of the social sciences? Given that social science is subdivided into various disciplines – economics, political science, sociology and anthropology are the ones usually identified – can we explain these subdivisions in the same way that we can explain the subdivisions within biology and chemistry? In other words, can we identify *vertical* relations between the social sciences such that they constitute distinct, emergent levels of reality?

The category ‘social’ should be differentiated according to ‘aspect’ rather than level of reality. The different aspects of social structure are not emergent from each other; rather, the categories economic, political, legal and ideological refer to entities emergent at the same level of reality; therefore, they must be regarded as designating particular types of horizontal ontological depth – dependence and interdependence. We must also recognize that higher-order social entities, such as totalities – systems’ internal relations – can be differentiated according to the types of social (and natural) structures constituting them; for it is by virtue of the possibility that social and natural structures may be internally related to each other that higher-order entities may emerge. Consider the social structure of “tenancy”. This structure will be causally dependent on other types of structure. For example, the landlord’s right to demand rent from the tenant for occupation of the property

presupposes a structure of property ownership because the landlord must be the owner of the residence if he is to accept tenants. In turn, the structure of property ownership (in this case housing) is internally related to the market for owner-occupied housing because such a market could not exist without it. The structure of tenancy is internally related to the market for rented housing because, again, such a market could not exist in the absence of tenancy agreements.

What makes a particular set (conjuncture) of relations between structures a totality (emergent system) is that the internal relations between the structures give rise to holistic causal properties. Because the structures within a conjuncture may be internally as well as externally related and because social reality is always changing, we need to think of totalities as being open, incomplete and partial. We must also recognize the possibility of internal and external relations between totalities and thus the possibility of new, higher-order entities emerging. Consider the complexity of the causal relationships between marriage, the family, the labour market, employment, education and training:

- The relationship between the labour market and marriage is external because what is necessary for the existence of a labour market is a supply of labour power and it is contingent upon whether or not the people who supply their labour power are married. In the past, it was expected that husbands would enter paid employment while wives would engage in unpaid work at home. Today it is generally expected that both husbands and wives will be in paid employment. Therefore, we have a relationship of *causal influence* between marriage and the labour market.

Marriage affects the working of the family in the sense that changing expectations about the length of marriages and the acceptability of divorce have influenced the structure of the family; for example, the increase in the number of remarriages has led to an increase in the number of extended families involving 'step children' and 'step parents. So, the relationship between marriage and the family is one of *causal influence*.

Changes in the nature of employment may also affect the working of the family in the sense that increases in work intensity may have an adverse effect on parents' ability to raise their children well. So, the relationship between

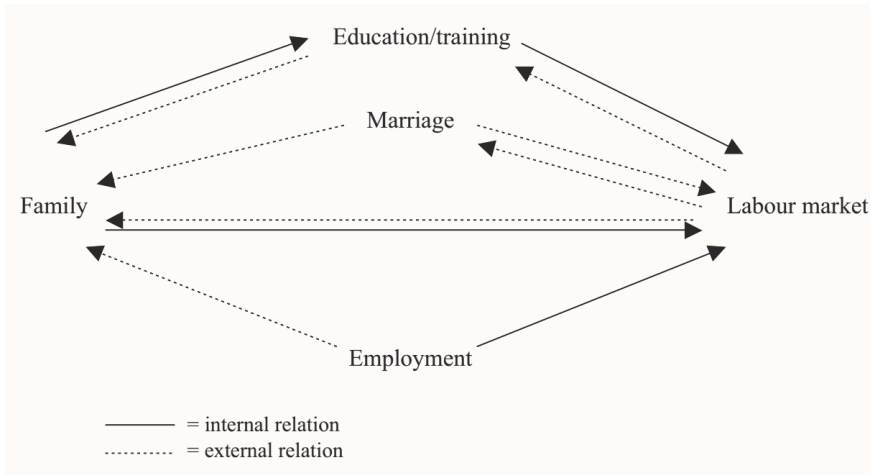
employment and the family is one of *causal influence*. Because a supply of labour power is essential to the existence of a labour market and because the family is the means by which new labour power is created (through human reproduction), the labour market is *causally dependent* on the structure of the family. But, the working of the labour market also *affects* the working of the family in the sense that changes in the availability of paid employment may influence people's decisions about whether or not to have children and may affect the ability of existing parents to ensure an adequate upbringing for their children. So, the relationship between the family and the labour market is one of both *causal dependence* and *causal influence*.

The labour market is *causally dependent* on the structure of paid employment because the different instances of the employment relationship are the basis on which people compete against each other as buyers and sellers of labour power. Relationships of both *causal dependence* and *causal influence* also exist between the labour market and education and training. For example, a supply of *skilled* labour power presupposes a structure of education and training, while changes in the demand for skilled workers of different types may affect how people are educated and trained.

Similarly, the relationship between education and training and the family is one of both *causal dependence* and *causal influence*. For example, the existence of the teacher–student relationship depends on a supply of people to be taught, which the family provides, while changes in the education curriculum, for example through the introduction of parenting classes and comprehensive education, may affect people's ability to be good parents and their view of marriage and family life.

Fig. 4 gives a summary of the above relationships between social structures. What we have in Fig. 4 is an example of a partial totality. The structures identified as its parts are by no means exhaustive of the range of structures that may be connected to it; the inclusion of the structure of employment and the labour market points to connections with structures of ownership, production and exchange. The point of this example is to illustrate the complexity of social objects and the need to think carefully of the distinctions as well as the connections between their parts.

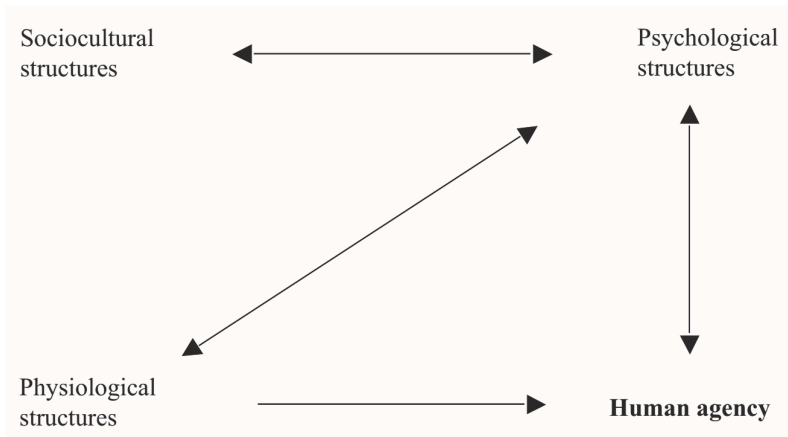
Fig. 4: Causal dependence and causal influence between social structures



The role of science is to uncover specific configurations of structure. Herein lies the justification for the integration as well as the differentiation of science, for we need specialized forms of scientific inquiry to understand the essential nature of different types of causal object – whether these different types of objects pertain to the vertical or horizontal stratification of reality – and integrative forms of scientific inquiry to understand the precise connections between the different types of causal object. Abstract social sciences (such as political science and economics), therefore, can take us only so far in our understanding of social objects: we also need ‘intermediate’ abstract sciences, such as political economy if we are to understand the connection(s) between the political and economic aspects of social reality.

The multiple determination of events and states of affairs, then, implies that we need to draw on theories from different scientific fields to understand how different types of causal objects work together to generate phenomena of interest. Take the example of a ‘noise-induced hearing impairment’ which involves physiological structures, which determine a person’s ability to hear; psychological structures, which determine a person’s experience of the hearing impairment; and sociocultural structures, which determine how deaf people are received in society. We can represent the relationships between these different mechanisms and the particular aspect of human agency of interest – that is, the ability to hear – as shown in Fig. 5.

Fig. 5: Sociocultural and psychological structures



In Fig. 5 we have three different types of structure, all of which are the preconditions for human agency. The sociocultural and psychological structures presuppose each other – that is, they are existentially interdependent – and so emerge at the same level of reality. Sociocultural mechanisms enable us to use our minds because they give specific content to human consciousness and it is through our consciousness of the social and cultural world that we can act. Hence, human agency is causally dependent, via the operation of psychological mechanisms, on sociocultural mechanisms. However, sociocultural mechanisms are causally dependent, via the operation of psychological mechanisms, on human agency because it is through the exercise of human agency that we reproduce and transform the social and cultural world.

Yet, human agency also depends on the operation of physiological structures – for example, the delicate apparatuses that give us the power of sensory perception and the ability to move – while human consciousness also depends on the operation of the brain; and, *vice versa*, the operation of physiological mechanisms depends on the exercise of human agency in the sense that we must feed ourselves to survive. So, we can see that human agency is embedded in, and so emergent from, a (partial) system of causal mechanisms of different types – social, psychological and physiological.

Consider the example of deafness. Even if deaf people regain some of the

functions they have lost, this does not mean that they will not be disabled because the very fact that they cannot communicate in the normal way or find it difficult to communicate with able-bodied people, will mark them out as different and may set off a sociocultural process of stigmatization; and the lack of understanding that deaf people receive from able-bodied people may trigger psychological mechanisms causing deaf people to become depressed. In other words, a physiological impairment, such as hearing loss, is mediated socio-culturally and psychologically.

Hence, if we want to understand the problems that disabled people face in society, we need to understand the relationships between the different types of causal mechanisms relevant to their disability and their effects and so we will have to draw on and integrate knowledge of biology, psychology and sociology. If we try to overcome the problem of hearing loss simply by supplying a hearing aid, we will be implicitly assuming that deafness is a biological problem and thus will be guilty of scientific reductionism – of assuming that concrete phenomena can be explained by the theories of only one branch of knowledge. But, if phenomena in open systems are subject to multiple determination, we will need to use different methods of inquiry and we will need to develop different theories of causal mechanisms in respect of the range of causal objects that may be involved in the generation of the phenomenon in question.

We will also have to understand how the different causal mechanisms involved are interrelated, i.e., how they form a partial totality (partial system). Of course, we may not know which causal mechanisms are involved so that we may have to begin our inquiry from the perspective of one science. However, the results of practical experience – that is, the unintended consequences of our investigations of, and practical interventions in, the world – will help us to determine whether or not we need to draw on the knowledge of more than one science. For example, if we find that deaf people do not use the hearing aid they have been given, and if we find that they appear withdrawn or aggressive, we will be alerted to the possibility that deafness may be a social and psychological as well as a biological problem.

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Chapter 2

Systems Approach to the Integration of Knowledge: **EPISTEMOLOGICAL FOUNDATIONS**

1- Introduction

This chapter is a summary of the important book written by David Rousseau and his colleagues under the title “General Systemology” in which they tried to map a strategy for the development of a general science of systems which they called “General Systemology”⁵.

“Although a true unity of knowledge might be an unattainable goal, an increasing consilience of knowledge is not out of the question. One possible route to such consilience is offered by the vision of a general theory of systems. If everything in the world is a system or part of one, then general systems knowledge would not only be of transdisciplinary relevance, but afford deep insights about the interconnectedness of everything, and readily reveal to us important insights that cannot easily be seen from any specialized point of view.... Increasingly, knowledge of systems is seen as presenting a paradigm for addressing complex problems, that is, those involving phenomena that cannot be adequately modelled using the classically powerful approaches based on reductionism and linear causal mechanism. Additionally, it is ever more valued for its potential to support transdisciplinarity, i.e., the principles and models that characterize aspects of systemicity can be applied in multiple disciplines. The systems perspective is progressively seen as both necessary for understanding the complexity of the world in general, and as useful to researchers in a multitude of specialized fields” (David Rosseau et al).

5 - Rousseau, D., et al (2018): General Systemology. Springer, Singapore.

Systems researchers have in recent years proposed the term “Systemology” to refer to the organized body of knowledge about systems, and “General Systemology” to refer to the subset of systemology that represents the organized body of knowledge about the inherent nature of all systems; that is to say what is essential to or universally true about systems. General systemology is thus especially concerned with those attributes that confer “systemhood” or “systemness” or “systemicity” on things that we recognize as systems, and how the combination of these universal attributes gives rise to the behaviours we see in specialized kinds of systems. Thus, [in principle] there exist models, principles and laws that apply to generalized systems, or their subclasses, irrespective of their particular kind, or the nature of their component elements, and the relations or “forces” between them. It seems legitimate to ask for a theory, not of systems of a more or less special kind, but of universal principles applying to systems in general. In this way we come to postulate a new discipline, called General System Theory. Its subject matter is the formulation and derivation of those principles which are valid for “systems” in general” (Rousseau et al).

2- An Overview of General Systemology as a Strategy for Integrating Knowledge

“A core claim under the systems perspective is that everything we encounter is a system or part of one. If this is true then ‘being a system’, i.e., having the attribute we might call ‘systemness’ or ‘systemhood’, or being something that is ‘systemic’, is a matter of considerable significance. But what is that significance? The full meaning of the term ‘system’ is not settled yet, but the term ‘system’ appears to be used somewhat like how we use the term ‘energy’, a general term for the something we can only know through specific instances. And just as coming to understand the nature of energy transformed our understanding of how specific things work and what particular kinds of change are possible, so too, perhaps, will understanding the nature of systems transform our understanding of the world as a grand scheme, and transform our understanding of our place and our potential within that scheme” (Rousseau et al).

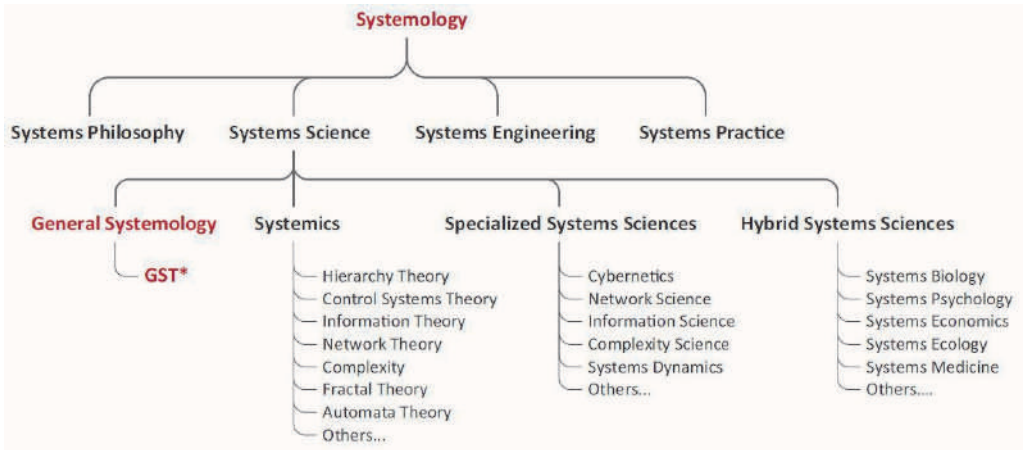
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Systemology, in the sense just defined, is a broad field, and encompasses systems philosophy, systems science, systems engineering and systems practice. As will be explained later on, ‘systems science’ encompasses the discipline of general systemology (which includes the general theory about the nature of systems), various specialized systems sciences (for example cybernetics, network science, information science, complexity science), and the hybrid systems sciences (which includes the disciplines dealing with the systemic aspects of specialized subject interests, for example systems biology, systems psychology etc.).

The specialized systems sciences are grounded in a range of specialized systems theories collectively known as the “Systemics” (representing the collection of specialized theories dealing with particular aspects of systemic behaviour, for example hierarchy theory, control systems theory, automata theory, etc.). The basic distinctions just enumerated are illustrated in Fig. 1 below.

Fig.1 Systemology Field



Source: Rousseau et al. General systemology

2.1- Potential Significance of General Systemology

The systems field is not yet unified because we are still lacking a general theory of systems. The existence, in principle, of a general systems theory (GST*) was first suggested about a hundred years ago, but the quest for establishing it only took hold in the West after the middle of the last century, and this was largely due to the work and advocacy of Ludwig von Bertalanffy, who is now widely regarded as the founder of the “general systems movement”.

The founders believed that a general systems theory (GST*) would support interdisciplinary communication and cooperation, facilitate scientific discoveries in disciplines that lack exact theories, promote the unity of knowledge, and help to bridge the divide between the naturalistic and the human sciences. The pioneers of general systems research saw this as a strategy and action plan for averting imminent social and environmental crises, and for opening up a pathway towards a sustainable and humane future. However, despite significant advances in the specialized systems sciences (“Systemics”) the ambition to develop a GST* and leverage it for human and ecological benefit remains largely unfulfilled.

2.2- Developing a Scientific Theory About the Nature of Systems

Making progress towards a more complete general theory of systems is crucial for the academic unity, credibility and advancement of the systems field. As discussed above, this means moving towards having scientific models that can reconcile the different perspectives on the nature of 'systems' in a compelling manner. To support such a scientific unity the subject matter must be defined in terms of a theoretical framework that has explanatory and/or predictive value. Such a scientific general theory provides a conceptual and explanatory foundation on the basis of which the discipline or field can grow as a scientific endeavor of increasing epistemic and empirical competence.

In the life of a discipline or field the transition from viewing its subject matter merely in terms of descriptive models and theories to being able to represent it in terms of explanatory/predictive theories is of crucial significance. It is well known from the history of science that general theories such as Newton's Laws of Mechanics, Mendeleev's Periodic Table of the Chemical Elements, Lyell's Principles of Geology, and Darwin's Theory of Biological Evolution, transformed their respective disciplinary fields by (a) unifying hitherto fragmented areas of study under a common conceptual and explanatory framework, and (b) rapidly opening up new avenues to scientific discovery.

In the case of the systems domain, the sought-for scientifically-unifying theory would be the "General Systems Theory" (GST*) as originally envisioned by Ludwig von Bertalanffy. Von Bertalanffy proposed that structures and behaviors that recur isomorphically across kinds of systems indicated the existence of general systems principles that would underpin the formulation of general systems laws that could be applied in diverse disciplines for problem solving, modelling, and design. The key advances toward a GST* seem mostly to have been made long ago, and general systems research has been a minority endeavor for the last 30 years. In reality, it was the practical offshoots of theories about individual isomorphies that took precedence, resulting in advances in Information Theory, Cybernetics, Organization Theory, Control Theory, Management Science, and so on. This pragmatic focus produced progress at a high cost, for it left these theories together with the possibility of a "GST" philosophically immature.

The systems field cannot become an established academic discipline without

developing a unifying framework grounded in a general theory of systems. Such a unifying framework for the systems field exists in principle and that its development is a practical prospect. It would support the development of powerful and useful systemic methodologies for discovery, insight, innovation, intervention, management, control and engineering in all branches of science. To develop a general systems theory (GST*) the following questions need to be addressed:

- What is “GST”?
- How might it fit into the “systems field”?
- What would it look like?
- Does it exist in principle? Under what perspective(s)?
- How might we discover/develop it?
- What might its potential be? Would it have any distinctive powers?
- How can we support progress towards establishing it?
- What can we discover if we take on board recent developments in science and the philosophy of science and apply this to what we know about systems?

Progress towards establishing a valuable and competent General Systemology can be made by focusing on the development of:

1 - *a General Systems Worldview (GSW)* that is informed by our best scientific knowledge, by new discoveries in systems science, by advances in general systems research, and by the debate about the unity of science and the plurality of perspectives employed in systems thinking and practice.

2 - *a General Systems Theory (GST*)* that includes:

- an ontology of systems that can be used to describe systems and classify them in an unambiguous way;
- models that characterize the conditions and processes that support the evolution, persistence or degradation of systems; and

- principles and theories that explain the mechanisms that underpin the evolution, persistence or degradation of systems.
- 3- *General Systems Methodologies (GSMs)* that can leverage GST* under the guidance of the GSW to:
- extend and refine GST*, the GSW and the methods of General Systemology;
 - discover new Theoretical Systemics, i.e., specialized theories about kinds of systemic structures, processes, behaviours, etc., or enhance existing ones;
 - discover new Methodological Systemics, i.e., specialized methods for systemic research, design, engineering, management, education etc., or enhance existing ones; and
 - support exploratory science in all areas of scientific inquiry.
- 4 - *General Systems Transdisciplinarity (GSTD)* that employs the GSMs to address the looming and present crises facing human civilization; and to contribute to the building of a thriving future world.

3 - A Disciplinary Field Model for Systemology

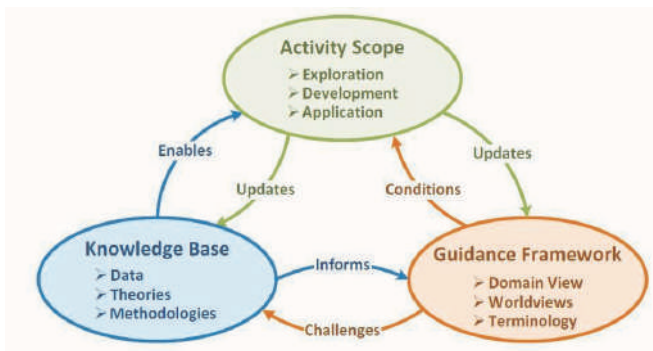
The most urgent issue to be resolved in addressing the academic challenges of the systems domain was to resolve the basic terminological ambiguities in referring to the field and its components, so that a clear strategy can be formulated for dealing with the field's scientific challenges. This can be achieved in a systematic way by mapping the components of the field onto the structure of an academic discipline.

3.1- A Systems Model of Discipline

Any disciplinarian's worldview motivates and constrains the focus of their actions, and determines the meanings they ascribe to their data, theories, methods and outcomes. From this perspective we can see that a discipline is really a kind of system, comprising *a form of action* conditioned by *a worldview* and expressing *a body of knowledge* centered on some area of interest. The

evolving body of knowledge belonging to a discipline not only *informs* its worldview but derives its *meaning* from the discipline’s worldview. In this light a discipline can be modelled as a system comprising an “activity scope” that is enabled by a “knowledge base” but conditioned by a “guidance framework”, as shown in Fig. 2. Let us call this the “Activity-Knowledge-Guidance” Model of a Discipline, or “AKG” model for short. Fig. 2 shows the main elements of a disciplinary system and the ways in which they interdepend. Each of the main elements has components that are again interdependent but for simplicity these subcomponents are merely listed. These components have internal subdivisions too.

Fig. 2- AKG Model



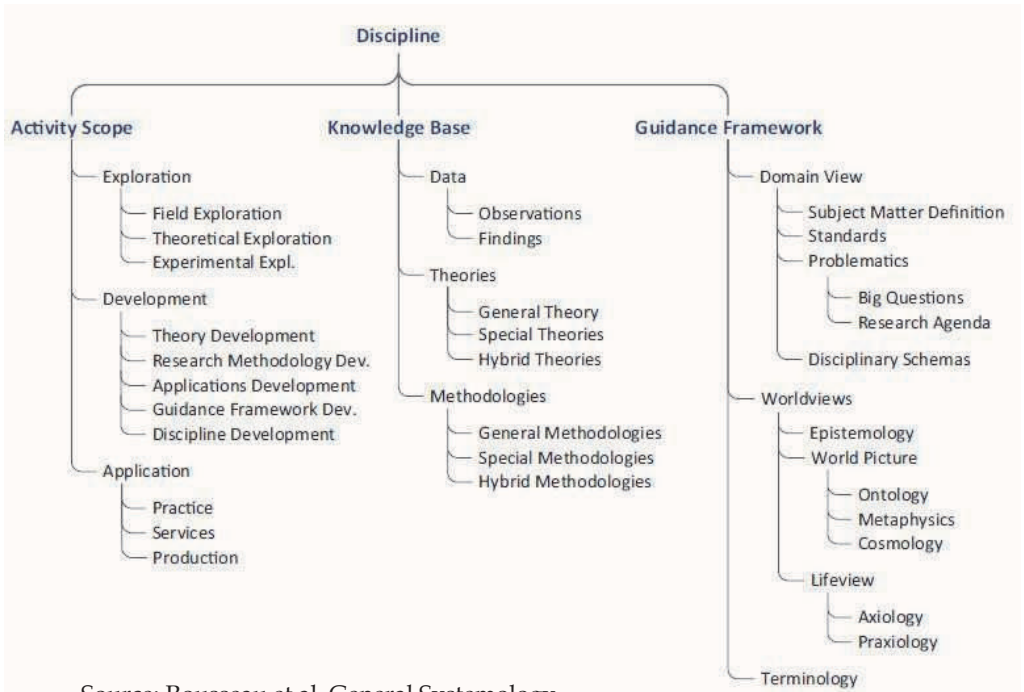
Source: Rousseau et al. General Systemology

An interesting point highlighted by this model is that the Guidance Framework of a discipline typically involves multiple worldviews. The same subject matter can be studied from different worldviews, and the theories around a given subject can be interpreted differently from different worldview perspectives. Such different approaches to the same subject matter give rise to “disciplinary schools” within a discipline. The schools have the body of knowledge in common, but their different worldviews differentially guide the interpretations and activities of the schools’ adherents. For example, within Biology the naturalistic school and the creationist school have different interpretations of the meaning of the theory of evolution, and have different perspectives on the purpose of studying the natural world, and on how knowledge about the natural world may be used. In general, references to a discipline are actually references to the dominant school, and the competing

schools are identified by qualifications such as “creationist” or “realist” or “constructivist”.

Fig. 3 depicts a tree structure of the AKG model. Such a hierarchy preserves containment relationships but unfortunately it obscures the dynamic interactions between the system components. However, it has the important advantage that it can be expanded to show increasing levels of detail as needed. The structure and subdivisions of Fig. 3 broadly follow conventional understandings of the terms used, but some differences necessarily arise because of the attempt to be comprehensive without getting bogged down in pedantry about terms. For this reason, it will be useful to give a brief outline of the conceptual terrain captured by the terms and relationships shown in Fig. 3.

Fig. 3 AKG Model



Source: Rousseau et al. General Systemology

3.1.1- The Disciplinary Activity Scope

1. *Exploration*, being research activities that include:

- (i) *Field Exploration*, research aimed at describing the subject matter in its natural context;
- (ii) *Theoretical Exploration*, research aimed at identifying alternative possible interpretations of the field observations and generating hypotheses for testing; and
- (iii) *Experimental Exploration*, research aimed at testing hypotheses under partially controlled conditions.

2. *Development*, involving research and reflection towards:

- (i) *Theory Development*, to update or extend disciplinary theories to accommodate the findings of experimental exploration;
- (ii) *Research Methodology Development*, to use the insights from theory development to provide new/improved research methodologies;
- (iii) *Application Development*, to use the findings and insights arising from exploration and theory development to develop new/improved methods for professional practice and physical production, and new/improved designs for products and service systems;
- (iv) *Guidance Framework Development*, to adjust the discipline's guidance framework in the light of the meanings and implications of the findings and insights; and
- (v) *Discipline Development*, work aimed at sustaining, improving and expanding the discipline as such. For example, the development of disciplinary standards for conduct and education, and the development of disciplinary targets and priorities.

3. *Application*, involving using disciplinary knowledge and skills to enable:

- (i) *Professional Practice* that addresses specific problems of individuals by giving advice, taking action or providing support;

- (ii) *Services* provided via service systems that address, for example, general human needs for safety, health, education, dignity; and
- (iii) *Production* of materials, equipment and infrastructure that support individual and social welfare.

3.1.2 *The Disciplinary Knowledge Base*

The disciplinary knowledge base comprises the key resources that enable disciplinary activity. These comprise:

1. *Data*, consisting of:

- (i) *Observations*, being descriptions of the subject matter as encountered in ordinary contexts. These include descriptions of the subject matter entities in terms of their appearance, structure, behaviour, powers, and functions; and
- (ii) *Findings*, representing the outcomes of experiments and tests under partially controlled conditions.

2. *Theories*, consisting of:

- (i) *a General Theory*, i.e., a theory that applies always and everywhere within the discipline, and is the basis of its scientific unity, for example the Periodic Table of Elements in chemistry and the Theory of Evolution by Natural Selection in Biology;
- (ii) *Special Theories*, i.e., theories about subclasses of the subject matter. For example, in Chemistry these include theories about classes of chemicals, for example metals, radioactive isotopes, polymers; and
- (iii) *Hybrid Theories*, i.e., theories that combine special theories with theories from other disciplines when interests overlap. For example, in the case of Chemistry these are hybrid theories such as those of Biochemistry, Geochemistry, Nuclear Chemistry, and Neurochemistry.

3. *Methodologies*, consisting of:

- (i) *General Methodologies*, i.e., disciplinary ways of working that are of general utility across the specializations of the discipline;

- (ii) *Special Methodologies*, i.e., structured ways of tackling specialized kinds of disciplinary problems; and
- (iii) *Hybrid Methodologies*, i.e., structured ways of tackling problems involving multiple disciplines. In substantive cases they become the methodologies of Hybrid Disciplines.

3.1.3- *The Disciplinary Guidance Framework*

The disciplinary guidance framework provides the context that conditions disciplinary activity, giving direction and focus, and setting boundaries, standards and priorities. More specifically, it involves:

1. *A Domain View*, comprising:

- (i) *a Subject Matter Definition* that specifies the scope and range of the discipline's interests;
- (ii) *Standards* for governing professional conduct and ensuring quality;
- (iii) *a Problematics* comprising:
 - *The "Big Questions"* the discipline seeks to answer;
 - *A Research Agenda* that defines and prioritizes the work of the discipline; and
- (iv) *Disciplinary Schemas* that map the relationships between the components of the discipline.

2. *A Worldview*, comprising:

- (i) *an Epistemology*, that explains what knowledge is, describes what enables, conditions or prevents the acquisition of kinds of knowledge, discusses opportunities for and limits on what we can come to know; and explains how the models and theories of the discipline can be used to acquire knowledge relevant to the purposes of the discipline; and
- (ii) *a World Picture* comprising:
 - *An Ontology*, i.e., a theory of what exists most fundamentally, for example "physical atoms", or "God" or "Tao";

- A *Metaphysics*, i.e., a theory about the nature of what exists and hence what is possible, for example “all changes are proportional to changes elsewhere”, or “all events have sufficient reasons”, or “all outcomes are due to Divine providence”; and
- A *Cosmology* (model of the origin, history, organization and possible futures of the concrete world). Things are “concrete” if they have causal powers; this distinguishes them from *abstract* things, which can also be considered to be “real” in the sense of having existence independently of our imagination (for example numbers) but that do not have causal powers.

3. A *Liferview*, comprising:

- an *Axiology* (a value system and theories about the nature of values and how to make value judgements); and
- a *Praxeology* (theory about the nature of action, agency, freedom and responsibility).

4. A *Terminology* that provides the standard terms and coherent concepts needed for model building in the discipline’s domain of operation.

3.2- *Kinds of Disciplines*

The AKG model provides a way of distinguishing between a topic, theory or activity, and a complete discipline. A discipline, in this light, is an interconnected system, comprising activities that, under the conditioning influence of a guidance framework, produce outputs that include updating knowledge about a defined subject matter. The term “discipline” so defined is clearly very broad, and hence it can be used to characterize a variety of kinds of disciplines, which can be differentiated as follows.

Theories can be either general, specialized or hybrid theories, and hence the methodologies they enable can be either general, specialized or hybrid methodologies. The general theory that characterizes the subject matter of the discipline applies in and connects the special and hybrid theories/methodologies, and in this sense is a “meta-theory” over the special and hybrid theories and methodologies, thereby forming the basis of the unity of the discipline.

As a discipline matures its theories and methodologies become rich and diverse, and this gives rise to sub-disciplines dedicated to refining, extending, promoting and applying the original discipline's individual theories or methodologies. In this way a strong discipline soon becomes a "disciplinary field", divisible into general, special and hybrid *disciplines*. In this case the general theory (meta-theory) of the field becomes a special case of a *transdisciplinary* theory, because it now applies in and connects between the special and hybrid disciplines of that field. In this way the "general discipline" in a field is a "trans-discipline" that applies across the special and hybrid disciplines of the field, and is also the discipline that underpins and develops the scientific unity of the disciplinary field. The disciplines commonly encountered across academic institutions are the most advanced ones, and hence the disciplinary divisions we typically encounter in academia are disciplinary fields.

An interesting observation that follows from looking at disciplines and fields in this way is that there is a meta-theory at the heart of every discipline, and a trans-discipline at the heart of every disciplinary field. The scope of such metatheories and trans-disciplines is however typically limited to the scope of the discipline or field they unify. This represents a special case of transdisciplinarity, different from how it is usually discussed, namely as applying across the major traditional academic divisions we have here identified as fields. However, this framing follows directly from the basic meanings of the terms 'transdisciplinarity' and 'discipline'. This does not eliminate or replace the idea of a transdisciplinarity that crosses the boundaries between fields, but it does indicate that there are different kinds of transdisciplinarity which we should be careful to disambiguate.

As noted earlier, disciplines fragment into schools based on differences in worldviews such as Naturalism, Creationism, and Constructivism. However, within a field there are also connections between the schools that share a worldview, so that together they form a community of practice we call a disciplinary "tradition" within the field. A tradition opens up channels of communication and co-operation between schools, via the perspectival unity provided by the common worldview. These channels extend beyond the disciplinary field to also facilitate communication and cooperation with consilient schools in other fields. This is powerful for the schools associated

with the dominant tradition in a field, but it can also be a limiting factor by inhibiting exploration of alternative perspectives and reducing sensitivity to the inherent fallibility of human perspectives.

A *discipline* can be viewed as something that has the tripartite content structure we elaborated earlier, comprising an activity scope, a body of knowledge, and a guidance framework (the AKG model), and has a fixed subject matter but not a fixed worldview. If the worldview is fixed, then we have a *school* within the discipline. A discipline can be comprised of *sub-disciplines*, each focused on a specific aspect of the disciplinary subject matter. A collection of disciplines unified under a general theory constitutes a *field*, and as the general theory is then transdisciplinary the discipline that provides it a (unifying) *trans-discipline*. Within a field there can be various *traditions*, represented by the schools that share a common worldview.

Every discipline, school and tradition in the field will have the tripartite content structure (activity, knowledge base, guiding framework). The field includes the contents of all its constituent disciplines, and therefore it also has the AKG structure in terms of its contents. It should however be noted that the field is more than merely the sum of its constituent disciplines. The field's structure establishes systemic relationships between the constituents that both limits and empowers them, and the whole provides a stronger basis for the development of the constituents by placing them in context relative to other disciplinary fields. The status and strength of the field lends credibility to its constituent disciplines and schools, creating opportunities for funding, recruitment and participation, and providing connections that stimulate theoretical and methodological innovation.

On the other hand, the field also constrains its components by introducing standards, regulating behaviour, setting priorities, and so on. The field is unified by the general theory that is the same for all the disciplines. In practice the situation can be even more complicated, and so we must recognize the existence of fields that have both fields and disciplines as components, in which we can call the component fields "sub-fields" and the overarching field a "super-field".

For example, we can view science as a field that includes subfields such as physics, chemistry, and biology as well disciplines such as philosophy of

science. Science (as the study of nature) is unified under a shared theory about the nature of nature as comprehensible and investigable. Biology is a subfield of science that unites biological disciplines under the theories of evolution and genetics. Biology disciplines such as plant biology have many sub-disciplines studying aspects of plants, or kinds of plants. Biology contains multiple schools, for example the naturalistic school and the creationist school, and these schools are the biology representatives of the naturalistic and creationist traditions in the field of science.

3.3- Systemology Modelled as a Disciplinary Field

Applying the AKG model of a discipline we can now begin to characterize the systems domain in disciplinary terms. To do this, we have to select suitable names for the various elements of the systems discipline.

3.3.1- The Nature of the Systems Discipline

In the light of the analysis just given, systems science is a disciplinary field containing the general discipline of general systemology, many specialized systems disciplines (for example Cybernetics, Management Science, and Operational Research), and many hybrid systems disciplines (for example systems biology and systems psychology). These disciplines can all be represented by schools grounded in specific worldviews such as in Scientific Realism or Constructivism. The disciplinary schools can be grouped into traditions that span across the divisions into philosophy, science, engineering and practice.

Systemology will be used as the name designating the systems field, to encompass the specialized systems disciplines and sub-fields such as systems philosophy, systems science, systems engineering and systems practice.

3.3.2- The General Theory of Systemology

The crucial step along the path to becoming an academically viable disciplinary field is the establishment of a unifying theory. In the case of Systemology, this would be a general theory about the kinds, nature, and evolution of systems. It is postulated that there exists, in principle, a theory encompassing “the universal principles applying to systems in general”. Let us denote this unifying general systems theory (GST*).

3.3.3- *The Unifying Trans-discipline of Systemology*

Apart from the need to develop a general theory, there is also a need for the establishment of a new discipline the subject matter of which is the derivation and formulation of the general systems principles, with a view to putting them to use to empower all the disciplines dealing with systems. This new unifying trans-discipline will be named *General Systemology*.

3.3.4- *The Specialized Theories of Systems Science*

The “special disciplines” of a field are concerned with developing and applying theories about specialized aspects or elements of the field’s subject matter. For systems science (Systemology) these would be theories about specific kinds of systemic structures or behaviours, for example control theory, network theory, hierarchy theory, automata theory and so on. The term “Systemics” will be used for this set of special theories. Systems concepts being transdisciplinary, Systemics are all formal theories, and hence applicable in different kinds of concrete contexts.

A formal theory is one that makes no ontological commitments, ranging over abstract entities that could be instantiated in many ways. This contrasts with concrete theories, which have specific ontological commitments that are essential for the theory to be valid. However, note that there are also “Abstract Methodological Systemics”, i.e., formal methodologies for analyzing systemic complexity for example in specialized systems disciplines such as Systems Dynamics, Systems Analysis, and Operational Research.

When abstract theoretical and methodological Systemics are employed by specialized orthodox disciplines (which have concrete subject matters), this gives rise to hybrid disciplines such as Systems Biology, Systems Geology and Systems Medicine. The theories of the hybrid disciplines can be called “Applied Theoretical Systemics” and their methodologies “Applied Methodological Systemics”. The “applied” systemic theories and methodologies differ from the “abstract” ones in that they involve specific ontological commitments, and hence are concrete theories and methodologies rather than formal ones.

Compared to other academic disciplines Systemology is unique in having this structure. In the case of, for example Mathematics “pure” Mathematics

and Applied Mathematics are both formal disciplines, and in the case of the orthodox sciences a “pure” science and its associated applied science are both concrete disciplines. Systemology, however, has both formal and concrete dimensions. This explains why many of the Abstract Theoretical Systemics (“Systemics”) are studied in Mathematics departments while the applied ones (specialized and hybrid sciences and systems practices) are not.

3.3.5- The Transdisciplinary Nature of Systemology

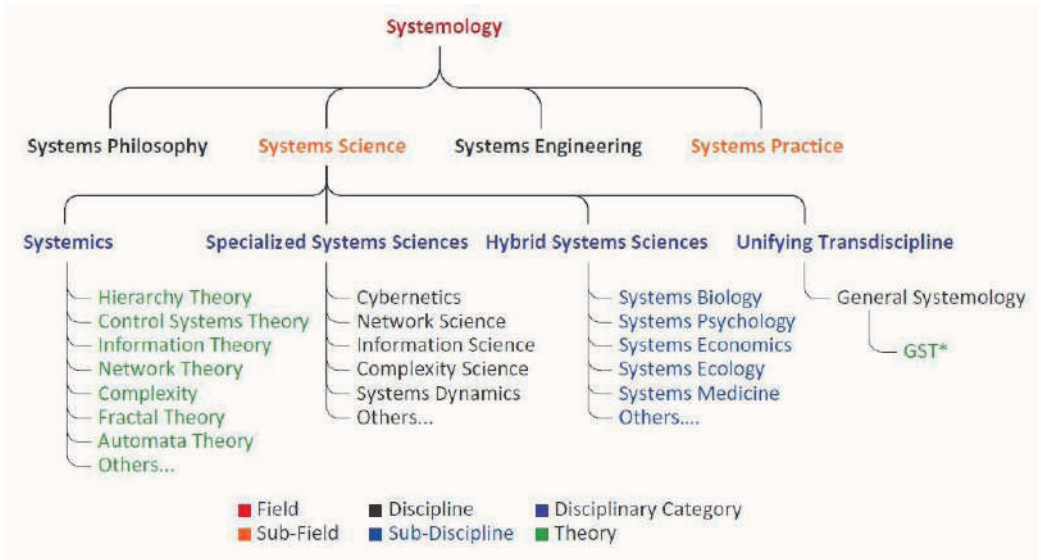
Systemology is an unusual disciplinary field because its core concept, “system”, is a transdisciplinary one. From the systems perspective one could characterize all the orthodox disciplines as studying specific kinds of systems, and hence the concepts, principles and models involved in characterizing aspects of systemicity (for example feedbacks and hierarchies) can be applied across the spectrum of orthodox disciplines. Consequently, the special theories, methodologies, and disciplines of Systemology are *all* transdisciplinary theories, methods and disciplines. This sets Systemology apart from orthodox disciplinary fields because orthodox fields have only one trans-discipline each, namely the one developing the general theory that unites the field. However, it should be noted that despite containing many trans-disciplines Systemology has only one trans-discipline responsible for developing its unifying theory (General Systemology).

3.3.6- A Typology for Systemology

We can now present a typology for Systemology from two perspectives, one showing the disciplinary structure of Systemology (a disciplinary spectrum model of Systemology), as illustrated in Fig. 5, and the other showing how its content is organized (a hierarchical AKG model of Systemology) as illustrated in Fig. 6.

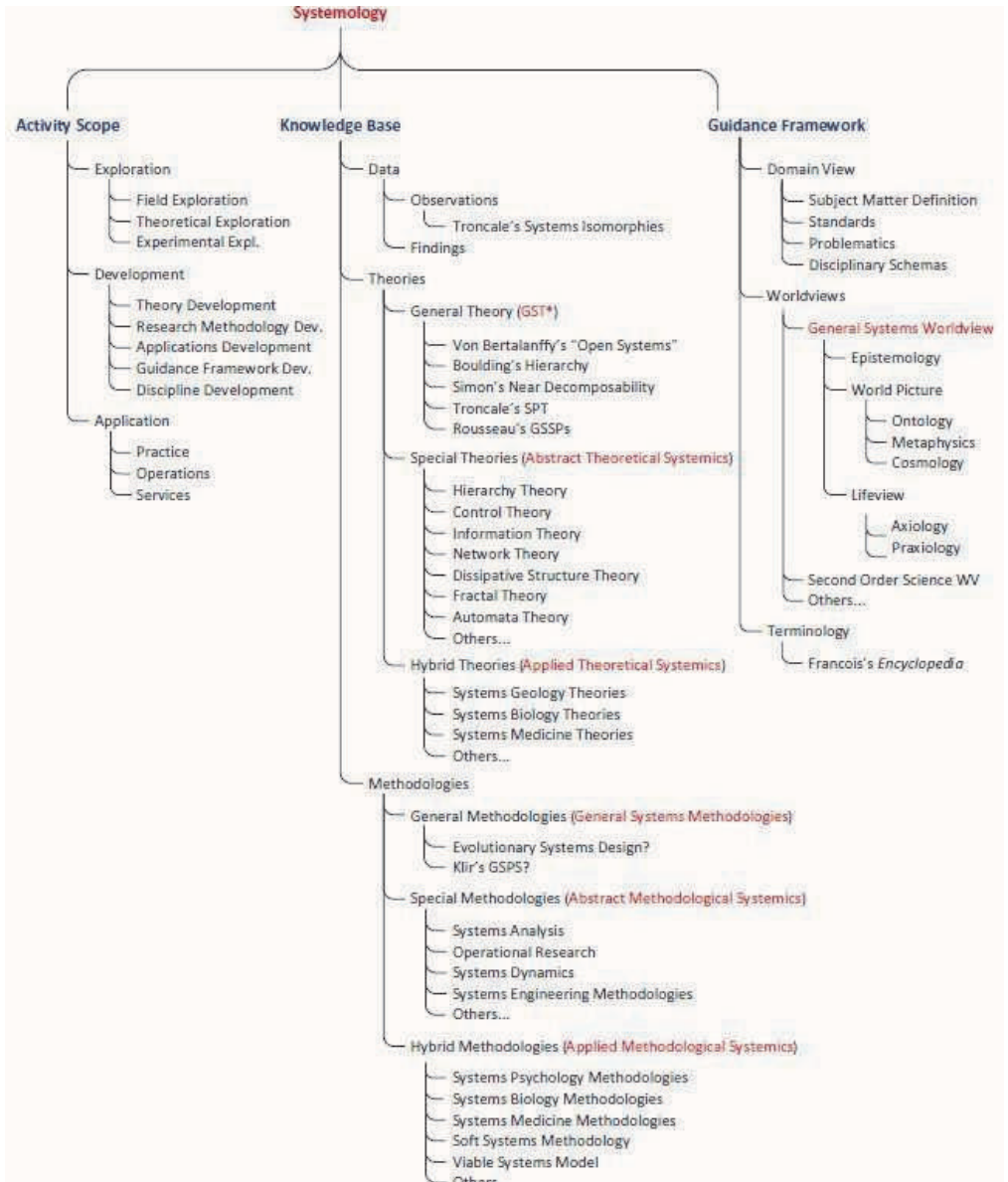
In the AKG map shown in Fig. 6 we have focused on the Knowledge Base of Systemology. The process of drawing the AKG map showed that Systemology is rich in methodologies (many hundreds) and relatively rich in special theories and hybrid theories (dozens), but poor in material relevant to GST*.

Fig. 5: Disciplinary spectrum model of Systemology



Source: Rousseau et al. General Systemology

Fig. 6: Hierarchical AKG model of Systemology



Source: Rousseau et al. general Systemology

3.3.7- Assessment of the Developmental Status of General Systemology

1. *Activity Scope*: At the moment we have no established GST*, and hence no GSTD as such, although some researchers are working towards developing and establishing it.

2. *Knowledge Base*: As yet we have no general theory of systems, but we have interesting and useful components to build on, including von Bertalanffy's proposed general systems principle – that there are no closed systems in nature.

3. Guidance Framework:

(i) *General Systems Domain View*: The potential scope and value of General Systemology have been widely discussed, but these presentations were often of wider scope due to the ambiguity of the historical term “GST”;

(ii) *General Systems Worldview*: We have no comprehensive synthesis yet, although we have early candidate models;

(iii) *General Systems Terminology*: Despite the clarifications terminology remains a problematic issue for General Systemology as indeed it does for Systemology as a whole.

The incomplete state of GST* and GSW is a serious impediment to the maturation of Systemology as an academic field, but in the light of the AKG Typology we can see where the key gaps are, and from this develop a focused plan for development. GST* would not only provide a scientific unification of the field and extend existing powers, but moreover a strong general theory would open up routes to discovering new abstract Systemics, and together with a developed GSW would open up new opportunities in exploratory science. Such advances would contribute in important ways to systemology becoming established as an academic field in its own right.

3.3.8- Summary

In the above sections we have developed a generic model for the structure of a discipline and of a disciplinary field, and used this to develop a typology for the domain of systems. In order to do this, we introduced a generic systemic

model of a discipline in terms of the interactions between a discipline's activity scope, knowledge base and guidance framework ("AKG model") and the structure of a disciplinary field in terms of a spectrum of fields, disciplines, schools and traditions.

Using these models, we developed a typology by:

- (i) identifying the domain of systems as a disciplinary field, and advocating it be named "Systemology";
- (ii) identifying the unifying theory of the field as von Bertalanffy's "GST" in the narrow sense and naming it GST*;
- (iii) identifying the trans-discipline GST* as the overarching general theory for a general systems discipline and adopting "General Systemology" as the name of this trans-discipline; and
- (iv) identifying the special theories of the field as corresponding to Bunge's use of the term "Systemics", and correspondingly introducing the class-names "Abstract Theoretical Systemics" and "Applied Theoretical Systemics" and the methodological correspondences in "Abstract Methodological Systemics" and "Applied Methodological Systemics".

We used the models and naming conventions developed in the above sections to sketch a preliminary map of the 'systems territory' conceived as a disciplinary field and explored how to use it to assess and discuss the structure and completeness of Systemology and its components in a non-ambiguous way, and to place the work that is being done to complete or improve systemological components in their proper context. It is hoped that will lead to further constructive discussions about the nature, structure, and completeness of the field of systemology.

Moreover, we have tried to show that the lack of a developed general theory of systems (GST*) is at the root of the fragmentation and limited influence of the systems field, and that progress with such a theory will be key for establishing Systemology academically and enhancing its impact. These concepts, models and views will be helpful in formulating agendas and strategies for developing Systemology into an established and valued academic discipline.

4- The Potential of General Systemology as a Trans-discipline

4.1- What Is Transdisciplinarity?

The term “transdisciplinarity” was coined in a typology of terms devised at the first international conference on interdisciplinary research and teaching in OECD member countries, held in Paris in 1970, where it was defined generically as “a common set of axioms for a set of disciplines”. Since then, interest in transdisciplinarity has grown rapidly, and it is currently “marked by an exponential growth of publications, a widening array of contexts, and increased interest across academic, public and private sectors”.

4.2- The Scope of Transdisciplinarity

As a relatively new academic development there is, as yet, “no universal theory, methodology, or definition of transdisciplinarity (TD)”, and there is a considerable diversity of opinions about its nature, scope, value and potential. Sue McGregor called it a philosophical movement, while Nicolescu identified it as a new kind of methodology but claimed it is not a new kind of discipline. Gibbons and colleagues deny that it involves a methodology but do claim that it is a new means of producing knowledge. According to both Cicovacki and McGregor, it requires a distinct axiological underpinning, while for Nicolescu it does not. Nicolescu has identified three kinds of TD which he classifies respectively as “theoretical TD” (which is concerned with developing transdisciplinary methodologies), “phenomenological TD” (which is concerned with using trans-disciplinary principles to build models and making predictions), and “experimental TD” (which is concerned with doing experiments using transdisciplinary methodologies).

4.3- The Aims of Transdisciplinarity

Despite this diversity of views about the *nature* of transdisciplinarity, there is considerable coherence in claims about its *aims*. Klein indicated that it is about addressing unsolved problems, especially societal ones. Gibbons and colleagues say it is about joint efforts to address problems pertaining to the interplay between science, society, and technology; problems that are not circumscribed in any existing disciplinary field. McGregor says it is an approach to solving deeply complex, interconnected problems that are too complex to be solved from within the boundaries of one discipline or by

using a conventional empirical methodology. For Tella, transdisciplinarity is intended to address the complex, wicked problems facing humanity (such as climate change, unsustainability, poverty), and for McGregor it is about interconnecting science, politics, and technology with society in a way that respects the survival of humanity in a future that is worth living.

4.4- The Character of Transdisciplinarity

All forms of transdisciplinarity engage with at least one of three overlapping concepts: **transcendence**, **problem-solving**, and **transgression**:

- *“Transcendence”* is about overcoming the barriers between disciplines, and in this sense transdisciplinarity is close to the ancient quest for the unity of knowledge, although the notion of “unity” has changed over time, to include aspects such as compatibility and consilience.
- Transdisciplinary approaches to *“problem-solving”* deviate from traditional approaches by placing great emphasis on “real world” problems, by involving feedbacks between organizations involved in research, design, education, services, and policymaking, and by a commitment to social, environmental, economic, and ethically sustainable development; and
- *“Transgression”* is about questioning the constraints of traditional disciplines. This is not a rejection of the ethics or rationality of disciplinary inquiry, but an acknowledgement of uncertainty and a willingness to critique, reimagine, reframe, or reformulate the status quo. This attitude allows established boundaries and limitations to be challenged and existing knowledge to be recontextualized, and in so doing opens up new routes to discovery, insight, and innovation.

4.5- The Varieties of Transdisciplinarity

TD is currently a dappled arena, with much consistency in its overall aims but also much diversity in how those aims are pursued. TD is simultaneously an attitude and a form of action. This characterization is helpful in understanding the diversity of forms TD currently takes, when taken together with the definition of TD as “a common set of axioms for a set of disciplines”. There are many kinds of “axioms” that can be proposed as assumptions, beliefs or

principles that would, if adopted, lead to the kind of “better world” that TD is focused on.

This diversity highlights a key question for transdisciplinarity, namely whether it represents a discipline in its own right or merely modulates the attitude with which existing disciplinary work is undertaken. This issue could be resolved in the light of the systemic model of an academic discipline. This represents a discipline as an “Activity Scope” informed by a “Knowledge Base” and conditioned by a “Guidance Framework”, which we call “the AKG model” in short.

The AKG model provides a way of distinguishing between a topic, a theory, an activity, an attitude, and a complete discipline. In the light of this model, we can see that the current diversity of kinds of transdisciplinarity can be characterized in terms of two major types. The first type involves a concern for the application of specific transdisciplinary values such as equal opportunity or sustainability. These kinds of values can be applied across multiple disciplines, but this serves only to extend the guidance frameworks of existing disciplines rather than generating trans-disciplines as such.

In the second type, TD involves the application, under a guidance framework (which includes values), of transdisciplinary theories such as GST* or Cybernetics. For this second type it is appropriate to speak of TD as the application of a trans-discipline, since there is a distinct discipline involved *in addition to* the orthodox ones over which its applicability might range.

In this light we can not only understand the origins of the diversity of kinds of TD that we have today, but we can see that the first type of transdisciplinarity is likely to evolve into the second type, as its proponents firstly develop methodologies for applying those value systems in different disciplinary contexts, and as theories are developed that explain the utility or appropriateness of those values and hence ground those methodologies in principled ways. From this we can view “type 1” TD as “early-stage type 2” transdisciplinarity, and see its evolution from “type 1” to “type 2” as a maturation from an intuitively compelling form of activism to an objectively compelling species of scientific endeavour.

However, we can also see that the value systems of current “type 2”

trans-disciplines will increasingly evolve under the influence of “type 1” transdisciplinarity to include transdisciplinary values, shifting them further from the classical ideal of science as a “value-neutral” endeavour to one that accepts responsibility for its impact in the world. We can thus foresee an evolutionary trajectory for all kinds of transdisciplinarity, involving the development of trans-disciplines that incorporate transdisciplinary theories, methodologies, and values. Moreover, we can anticipate that based on an emerging consilience between transdisciplinary theories, methodologies and values the diverse trans-disciplines might coalesce into a coherent transdisciplinary field. We will henceforth discuss transdisciplinarity only in terms of an “ideal type” that is the expression of a trans-discipline involving transdisciplinary theories, methodologies and values, and whose values align with a concern for building a “better world”.

4.6- Kinds of Disciplinarity

The focus of TD on problem solving calls for an explanation of how TD differs from other kinds of disciplinarity in its approach to problem solving, and how its value arises. Several kinds of disciplinarity are now recognized:

1. *Mono-disciplinarity*: this involves only a single discipline and is suitable for addressing well bounded phenomena or a single aspect of a complex phenomenon.
2. *Multi-disciplinarity*: this is used for addressing multiple aspects of a phenomenon by making use of several disciplines. It acknowledges their differences but involves no attempt to bridge between them.
3. *Cross-disciplinarity*: this is used where several academic disciplines are interested in the same aspect of a complex phenomenon. The different disciplines’ distinct methods are brought to bear on the same problem in a coordinated way, establishing a kind of middle ground.
4. *Inter-disciplinarity*: this involves combining several disciplines, attempting to synthesize them into something that provides a new perspective on the given problem; and
5. *Transdisciplinarity*: this involves disciplinary frameworks that are

developed from generalizations based on patterns that recur across or connect between several disciplines, and hence it involves insights about the general nature of the world rather than the special natures of specific kinds of phenomena. In contrast to other kinds of disciplinarity which bring the means of one or more specialized disciplines to bear on a specific problem, transdisciplinary frameworks are relevant to the phenomena studied in several disciplines, and hence TD introduces new means that can enhance the effectiveness of the disciplines it is partnered with.

Note that TD is different from the others in that it adds something new to the disciplines it generalizes over, rather than combining or merging existing disciplinary resources. Its value is realized when it is used in conjunction with one of those disciplines to address problems originating in those disciplines.

4.7- The Range of General Systems Transdisciplinarity

In every discipline the central objective is to maximize the scope of what can be explained, predicted, managed, or utilized. Doing this calls for different kinds of disciplinarity depending on the complexity of the issue. When dealing with a specific challenge the kinds of disciplinarity are typically engaged in the order of their relative complexity, to find the solution in the simplest possible way. However, given the nature and range of phenomena that still lie beyond scientific explanation, it is likely that scientific investigation will increasingly call for transdisciplinary working.

Transdisciplinarity is grounded in insights about patterns that recur across or connect between disciplines, and therefore it tells us something about the fundamental nature of the world that is not readily evident from within the specialized disciplines. Because of this it can powerfully enhance problem solving techniques in specialized areas, and thus be especially useful where specialized disciplines are addressing apparently intractable disciplinary problems, such as those that reflect deep ontological or epistemic issues.

Amongst the trans-disciplines, General Systemology is arguably the potentially most powerful, because it is grounded in the deepest of the general principles applying to the “real” world. Just like conservation of energy the principles of General Systemology will represent insights that are relevant in all disciplines

and in all contexts. However, some of them will have application beyond the principles of science, applying also, for example to abstract and conceptual systems.

4.8- The Scope of General Systems Transdisciplinarity

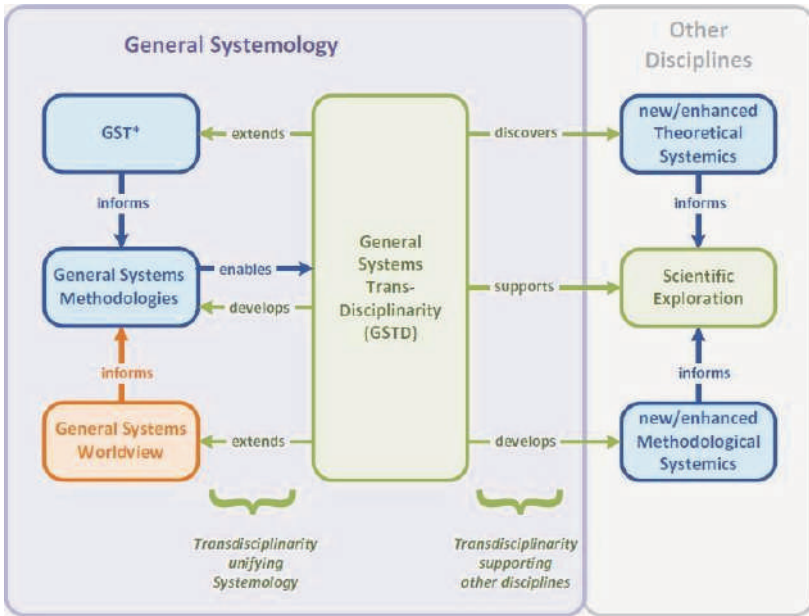
GSTD is more versatile than other forms of transdisciplinarity. This is so because General Systemology seeks to identify universal principles underlying the origin, evolution, and behaviour of all kinds of complex systems. As such its concepts, models and methodologies could be relevant in all areas of investigation and theory development. The transdisciplinary insights of General Systemology might be used not only to address complex problems, but also to support exploratory science, i.e., to develop testable hypotheses about unexplained complex phenomena that are not considered to be problematic but are nevertheless part of the context in which problem-solving is undertaken. For example, many familiar human abilities such as creativity and abstract thinking remain largely mysterious, and yet understanding them would contribute much to achieving the thriving future that is the focus of transdisciplinary ambitions.

The way in which GSTD can support these new developments is illustrated in Fig. 9. We use the blue color for components of the Knowledge Base, orange for components of the Guidance Framework, and green for components of the Activity Scope. The diagram illustrates the key components of General Systemology and shows the scope of its activities. As can be seen in the diagram, the activity scope of General Systemology has two transdisciplinary aspects. In the first, shown in the left half of the diagram, General Systemology functions as the unifying trans-discipline for Systemology, refining and extending the general theory (GST*) that applies across the specialized and hybrid systems disciplines. In the second aspect, shown in the right half of the diagram, GSTD leverages the methodologies of General Systemology to support/extend other disciplines and fields.

Amongst the trans-disciplines, General Systemology is perhaps the only one that has a *scientific strategy* for finding transdisciplinary patterns, by following von Bertalanffy's injunction to look for isomorphies of structures, behaviors and processes present in the designs of different kinds of systems under the guidance of the GSW. However, it must be noted that unlike the science ideal

of neutrality, General Systemology has from the outset maintained a concern for meaning and value and a commitment to building a “better world”. As such it has always pursued the ambition of bridging the gap between the object-oriented and the subject-oriented disciplines in a way that preserves the merits of each, and recent developments in General Systemology suggest that such a bridge can in fact be attained via the development of GST* and the GSW. In this light, General Systemology is likely to contribute significantly to the discovery, problem-solving and cultural transformation that will be needed to help us attain and sustain a thriving eco-civilization.

Fig. 9: General Systemology and General Systems Trans-disciplinarity



Source: Rousseau et al. General systemology

4.9- Summary

In the above sections we explored the differences between kinds of disciplinarity, including mono-, multi-, cross-, inter- and TD, and reflected on the value of each. We pointed out that at present there are multiple kinds of TD, but argued that these reflect differences in evolutionary trajectories and they

can be expected to converge (or at least become consilient) as transdisciplinary theories become more mature, and as links between them become evident on the basis of advances in GST*. In this way, we foresee the development of a general systems TD (GSTD) that will have relevance in all areas of human and scientific inquiry and provide a means to explore and address deep problems beyond the current scope of other kinds of disciplinarity.

5- The Nature and Value of General Systems Theory (GST)*

GST* is a formal theory that generalizes over the special systems theories, themselves generalizations over multiple disciplines. A mature GST* will unify the systems field by providing both a '*gestalt*' that relates the special theories describing the specific systemic behaviours and structures that occur in Nature to each other, and the principles that entail their evolution in Nature. Insofar as specific systemic structures and behaviours are modelled by the special theories collectively known as "Systemics", the implication is that the development of GST* will provide a principled basis for the discovery of new Systemics via General Systemology, as opposed to the incidental way in which Systemics have been discovered to date within the specialized disciplines.

The extent of the value of GST* depends on a very strong philosophical claim, namely that every concrete thing is a system or part of one. This is a core tenet of the GSW, and if this assumption is true then GST* would be relevant in all cases where science is studying concrete phenomena. In this case, having a GST* would be enormously empowering to all the specialized disciplines. Investigating the validity of the assumption that everything is a system or part of one must therefore be one of the core objectives of a research agenda for General Systemology.

*5.1- The Potential Existence of GST**

The central focus of Systems Philosophy is to develop a worldview based on scientific principles and the systems paradigm, and to use it to solve important problems in science, philosophy, and society. There is an intimate relationship between this worldview and GST. We do not yet have a fully-fledged version of this worldview either, but the situation is much more advanced than is the case for GST*. The worldview at stake here is informed by the findings of science and the philosophy of science as well as by the systems paradigm, and

so has much material to draw on. This perspective is traditionally called the “General Systems Worldview” (GSW).

The tenets of the GSW entail the existence of a GST*, that the development of the GSW can make important contributions to the development of GST*, and that progress with GST* will in turn inform the refinement of the GSW. To prepare the ground for presenting these arguments, a closer look at the notion of “worldview” is needed.

6- Worldview as a Perspective on the World and on Life

The term “worldview” is the English rendering of the term *Weltanschauung*. It was coined by Immanuel Kant, and it rapidly developed as “a term for an intellectual conception of the universe from the perspective of a human knower”. Essentially, a worldview is a “map of reality” that people use to order their lives. A worldview can be characterized as comprising three main elements, namely a perspective on the nature of knowledge (“epistemology”), a perspective on the objective nature of the universe (a “world picture”) and a perspective on the subjective significance of one’s existence in the world (a “life view”).

Technically and in more detail, we can define a worldview in contemporary terms as encompassing the following components:

1. *An Epistemology* (theory about what kinds of knowledge are possible and how to gain knowledge);
2. *An Ontology* (model of what exists most fundamentally);
3. *A Metaphysics* (model of the nature of what exists, i.e., what is possible given the Ontology);
4. *Cosmology* (high-level theory of the origins, history, organization, and destiny of the world);
5. *Axiology* (value system and theories about what is important and why); and
6. *Praxeology* (theory about the nature of action, agency, freedom and responsibility).

In this list, Ontology, Metaphysics and Cosmology comprise the objective “world picture” and Axiology and Praxeology comprise the subjective “life view”.

6.1- The Foundational Tenets of the General Systems Worldview (GSW)

The General Systems Worldview includes fundamental commitments in each of the worldview components, and these condition the way in which research toward completing and refining the GSW and the search for a GST* proceeds. Accepting the very concept of a GST* already implies a commitment to certain worldview tenets. Most fundamentally, the GSW outlook is a systems oriented moderate scientific realism. It is realistic in that it holds that the world has some objective aspects that we can have knowledge of; scientific in that it takes seriously the findings, methods and standards of science; it is moderate in that it acknowledges the limitations and conditionality of our knowledge and our ability to improve it; and it is systems-orientated in that it uses the systems concept to analyze the organization and dynamics of the concrete world.

For present purposes we can summarize the key tenets of the GSW using a framework of seven positions. Very briefly, the fundamental philosophical tenets of the GSW are:

T1. *Moderate Epistemological Realism:* We can progressively gain more complete real knowledge of the real world;

T2. *Moderate Ontological Realism:* A real concrete world underlies some of our experiences (but experiences can also be distorted or constructed or hallucinated);

T3. *Broad Naturalism:* Nothing supernaturalistic exists, but concrete phenomena cannot all be reduced to Physics;

T4. *Moderate Systemic Realism:* The concrete world is inherently systemic (but we can also project systemicity onto our experienced world);

T5. *Systemic Universalism:* Every concrete thing (everything that has causal powers) is always a real system or part of one;

T6. *Moderate Axiological Realism*: Values are largely constructed via cultural processes, but natural systemic processes also influence them; and

T7. *Moderate Praxeological Realism*: We have the capacity and freedom for uncoerced choices and actions, but our choices and actions can also be conditioned by natural and cultural factors.

These seven tenets are all metaphysical claims, in that they are about the nature of what exists most fundamentally or about what is inherently possible, but they bear on the full scope of a GSW. Specifically, they have implications for all six of the elements of a worldview as discussed earlier: T1 bears particularly on epistemology, T2 on ontology, T3 on metaphysics, T4 and T5 on cosmology, T6 on axiology and T7 on praxeology.

6.2- Arguing from GSW's Tenets to the Potential Existence of GST*

Taken together, the tenets T1–T7 listed above entail not only the existence of a GST*, but moreover that GST* has the kind of potential ascribed to it by the early systemists. If we assume that a real concrete world exists (T2), and that we can have a scientific model of it (T2 and T3), and that there are real systems in the concrete world (T4), then by implication, there is a scientific theory that models the systemic aspects of the concrete world. Granted this, if we assume that *all* concrete properties are conditioned by systemic processes (T5), it follows that there is a scientific theory about systemicity that applies everywhere and always. Hence there exists a GST*.

However, this argument goes beyond a mere existence claim, because if GST* is a theory involving principles that apply everywhere and always, then it has the same ubiquity and utility as general 'Laws of Nature' such as Conservation of Energy and the General Theory of Relativity. Discovering and developing a GST* could thus be of profound significance for science. Not only that, but under the tenets of GSW, GST* would also have implications that go beyond those usually associated with such Laws of Nature, just as the early general systemists proposed:

First, if values are to some degree systemically conditioned in a naturalistic way (T6), then GST* would be relevant to both naturalistic and humanistic concerns.

Second, if we have agency and free will (T7), then we can use our knowledge and our values to make a difference to how things turn out, so that we can in practice use the insights provided by GST* to change how the world evolves.

These are important inferences, but of course they hinge critically on the validity of the foundational tenets of the GSW. Given the unproven (but not wholly controversial) nature of these tenets, careful articulation and modern defense of these foundational philosophical assumptions are important outstanding tasks for a contemporary general systems research agenda. In the meantime, it is acknowledged that these tenets form a foundational but provisional assumptive framework for General Systemology.

6.3- The Potential of the General Systems Worldview (GSW) to Support the Development of GST*

So far, we have shown, based on arguments grounded in the tenets of the GSW, that we can have some confidence that a GST* exists in principle, and that it would be of great practical value to have it. We will now go further and argue that the GSW can also support the discovery and development of GST*. To develop this argument, we will first discuss an insight into the synergy between the GST* and the GSW.

6.4- GSW as a Counterpart of GST*

The Systemics and GST* are formal theories, that is, they contain no information about how the systems they describe are implemented. For example, Communication Systems Theory describes the functions and limitations of a communication system (for example encoding, signal transmission, detection, noise mitigation, decoding) but does not tell us anything concrete about the many ways in which such components as signal transmitters and receivers might be realized. Their lack of ontological commitments guarantees the Systemics' general applicability, but it does raise a puzzle as to why they should be effective in describing real-world phenomena across multiple domains, given that the disciplines in which they apply sometimes have dissonant ontological models. For example, both social systems and mechanical systems exhibit systemic properties such as emergence, synergy and dynamic stability, and yet macro-physical scientists typically assume the existence of an objective reality while social scientists mostly regard reality as a social construction.

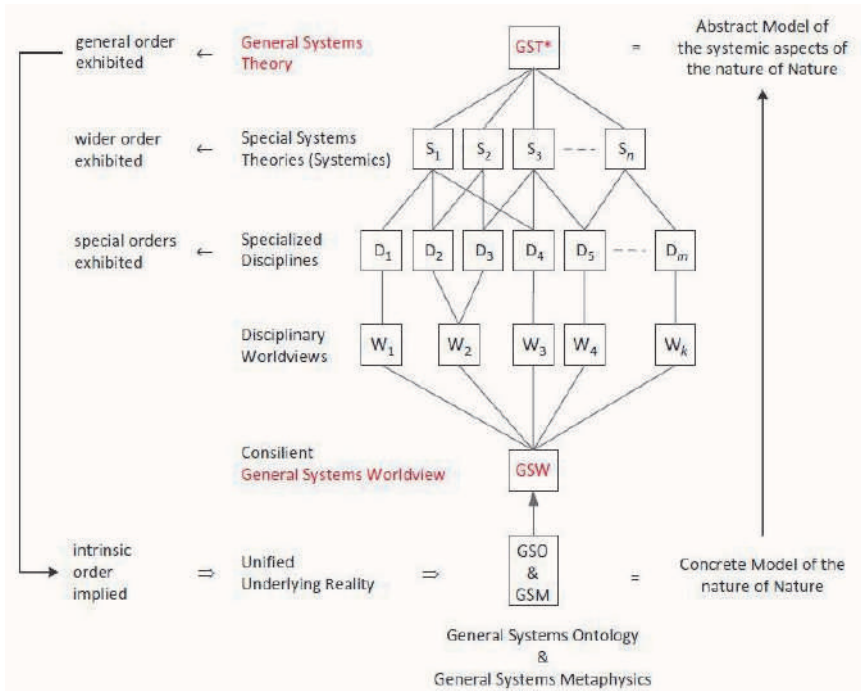
The solution to this puzzle was proposed by Ervin Laszlo in his book *Introduction to Systems Philosophy: Toward a New Paradigm of Contemporary Thought*. Laszlo's argument can be summarized as follows (Fig. 11):

The existence of specialized disciplines (Physics, Chemistry, Genetics, Sociology etc.) shows that the concrete world is *organized into intelligible domains*. The Systemics, by revealing patterns that recur isomorphically across these domains, cumulatively show that the concrete world is intelligibly organized as a *whole*. This global organization would be reflected in the principles and models of GST*. The existence (in principle) of global organizing principles entails that the concrete world's special domains (as characterized by the specialized disciplines) are contingent expressions or arrangements or projections of a unified underlying intelligibly ordered reality. In this way Laszlo argued that:

(a) the existence (in principle) of GST* implies that there is an intrinsically ordered, and hence unified, reality underlying Nature (designated here by the "General Systems Ontology (GSO)" in Fig. 11) and

(b) the content of GST* provides an abstract model of the systemic nature of this concrete underlying reality (designated here by the "General Systems Metaphysics (GSM)" in Fig. 11).

Fig. 11: General Systems metaphysics



Source: Rousseau et al. General systemology

In this light, the metaphysical nature of the underlying reality provides the conditions for the manifestation of systemic structures and behaviors in the specialized disciplines, since their phenomena are all grounded in a unified reality that is systemic in nature. The specialized disciplines all have explicit or implicit worldviews, and these each have an ontological and metaphysical dimension. At present these are not aligned in the way that Laszlo's argument suggests they might be. However, his argument suggests that present-day metaphysical differences between the different worldviews are a historical contingency, and that as science progresses these specialized worldviews will converge in their foundational metaphysical commitments, so that despite their specialized differences they will become *consilient*, reflecting the unity of the underlying reality. This does not imply that these currently distinct worldviews will collapse into a single 'master' worldview, but it does imply

that none of the disciplines will ultimately carry foundational implications that are inherently contradictory to any others`.

6.5- *The Value of GSW for Developing a GST**

Work towards developing the GSW can support the discovery and development process for GST*, in that the two are linked via the metaphysical framework we have called GSM. Via the GSM bridge advances in either GSW or GST* will inform and advance the other. The development of a GSW is not dependent on progress towards a GST* but can proceed on the basis of the findings arising in the specialized disciplines. This work can be facilitated by taking a more systematic approach, in which we summarize and compare the worldviews of the specialized disciplines in a consistent way. This could be done by first constructing a systems-oriented model of the structure and scope of a worldview and using this as a template for recording the basic commitments of the specialized worldviews. This will help us to identify common foundations but also metaphysical conflicts between worldviews. The former would represent the core of an emerging integrated GSW, and the latter could identify questions for investigation using a systems approach.

As the “core GSW” emerges from this comparison exercise, we are able to develop better clarity about the metaphysical foundation that links GSW and GST*. The richness of the material available in this area of work is immense. The opportunity for discovering general systems principles when working systematically with the basic findings of all the disciplines must be very substantial, and much greater than when trying to abstract such principles from the study of a relatively small number of isomorphies.

If it is true that the dynamics of all the structures evolving throughout nature are exemplifying underlying general systems principles, and all the kinds of systems we find in nature behave in ways consistent with general systems principles, then these principles can be expected to ‘shine through’ the data describing the world, if the data is organized in an appropriate systemic way. What we are seeking in constructing GSW in a systemic way is not merely a *taxonomy*, organizing the data in line with a set of empirical criteria, but a representative *typology*, a classification according to concepts that ‘carve at the joints’ of reality, or at least that part of reality that is represented by the body of scientific knowledge. If Systems Philosophy can find the joints of the

body of science, then it can be opened up to reveal the skeleton on which its integrity depends, GST*.

The development of such a worldview comparison framework is thus an important initial step towards a new and promising strategy for accelerating progress towards GST* and should be added to the research objectives of a contemporary research agenda for General Systemology.

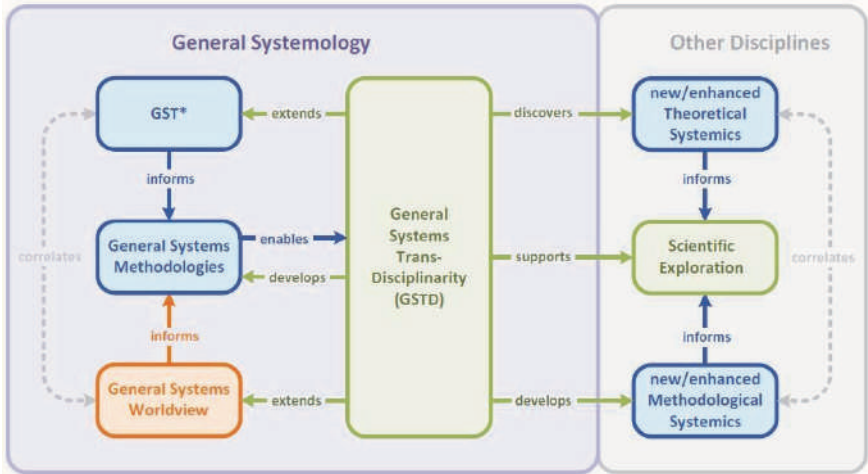
6.6- The Potential Value of the Synergy Between GST* and GSW

A GST* would provide a framework from which we can discover, in a principled way, kinds of systemic structures and systemic behaviours unanticipated by contemporary science. This is important for it heralds the discovery of new ways to understand, design, engineer or govern systems. A GSW, on the other hand, embodies our best understanding of the nature, state, and potential of the world as a total system, providing us with a framework for discussing questions of ultimate concern. Moreover, using the GSW framework to compare and analyze worldviews, we can identify opportunities for systems research that can deepen or extend our fundamental insights. Taken together, the mechanisms newly identified in the concrete world due to the development of GST*, and the potentials in the concrete world newly identified by developing GSW, can open up significant new avenues of systemic intervention.

In Fig. 12 we present this view of General Systemology's scope in a schematic way. We have here used the same colour scheme as we did for the "AKG Model" of a discipline we presented earlier, and used blue for components of the Knowledge Base, orange for components of the Guidance Framework, and green for components of the Activity Scope.

This framework heralds a new era of General Systems Transdisciplinarity, in which we use GST* and GSW as reference baselines for methods of doing fundamental research towards new Systemics and new fundamental insights and use these advances to develop methods for future waves of systemic intervention towards building the 'better world' the founders of the general systems movement envisioned. Such an extended version of General Systemology would realize the General Systems Transdisciplinarity that our present world needs even more urgently than it did at the founding of the general systems movement.

Fig. 12: Schematic Format for General Systemology



Source: Rousseau et al. General Systemology

7- The Knowledge Base of General Systemology

In section 3 we argued that the AKG model shows that all scientific disciplines (and disciplinary fields) can be modelled as having both a similar structure and similar dynamics in their development, and that this applies also to Systemology, even though it is a trans-discipline. In section 3 we also argued that each discipline has a unifying theory, and that this is a “general theory” in that it applies always and everywhere within its discipline. We argued that for Systemology that unifying theory would be GST*.

On the basis that this model shows disciplines to have a generic structure and generic dynamics, we suggest that the general theories of all disciplines have a similar structure to each other too and are also developed in similar ways. Consequently, we would therefore suggest that GST*, as the general theory of Systemology, will have a similar structure (and developmental pathway) to other general theories in other disciplines. In this section we will therefore expand the generic model of the knowledge base of a discipline, to show the generic structure of the general theory component (and its generic context), and from this propose where to look, and what to model, as we search for a GST*. In this way we hope to present a conception of the scope and structure of

a GST* that can guide research towards its development in a more systematic way than has been available previously.

Our strategy for developing the expanded model of a disciplinary knowledge base is to draw on the history and philosophy of science, by following the stages through which disciplinary activity builds up its knowledge base and guidance framework. We observe that scientific frameworks and core theories are built up cumulatively as scientists and scientific philosophers try to answer or improve answers to a structured series of generic questions. All these questions can be worked on in parallel, and the answers to each cross-inform the work on others, but overall being able to make good progress with anyone is dependent on the progress that has already been made with prior ones.

For ease of reference, we summarize these questions in Fig. 13. Each question motivates activity relating to a certain kind of disciplinary content, which we will label for convenience of reference. These terms are either used in conventional ways or in ways that generalize their conventional meanings.

Fig. 13: Generic Questions of a Disciplinary Knowledge Base

Questions		Content Type	Content Category	AKG Element
1	What qualifies something as a subject entity for the discipline?	Empirical identity criteria for subject entities	Empirical domain boundaries	Guidance Framework
2	How can we describe the subject entities?	Technical terms and definitions	Subject terminology	
3	Why do we limit the scope of the discipline as we do?	Perspectives and narratives about knowledge, nature, life and self	Worldviews	
4	What are the subject entities like?	Descriptions of observable features of empirical entities	Morphology	Data
5	How do they work?	Studies on the processes that produce/ sustain specific morphological features	Morphodynamics	Special Theories
6	How do they come about?	Studies on the intrinsic nature (natural kind) and intrinsic dynamics of the subject entities	Morphogenetics	General Theories

Source: Rousseau et al. general Systemology

Answering Q1 and Q2 produces essential precursors to knowledge generation by setting out the empirical boundary and the technical vocabulary for the investigation. The scope of these is conditioned by worldviews, which can be made explicit by answering Q3. In terms of the AKG Model, Q1- Q3 represent components of the discipline's Guidance Framework. This framing regulates and enables the building of the discipline's Knowledge Base. The foundational element of this is the collection and classification of empirical data (Q3). Data represents pre-theoretical knowledge that underpins scientific theory development, and it documents observable features of the subject entities. We will refer to this study area as "morphology". Data enables theory development, and this commences with activity towards developing specialized explanatory theories about the functions of specific entity features and the processes that underlie them (Q4). We will refer to this area of study as "morpho-dynamics". Data and specialized knowledge set the stage for work on a natural next question, namely how the subject entities come about (Q6). We will refer to this area of study as "morphogenetics".

Q6 is pragmatically addressed via four more subsidiary questions, namely: *how do the simplest subject entities come about? how do complex entities come about? and why do certain kinds of entities or entity designs not arise or persist?* The answers to Q6-type questions describe and theorize over factors relevant to all subject entities and are therefore contributions to the general theories of the discipline. Being common ground for the discipline, these theories provide scientific foundations for the unity of the discipline.

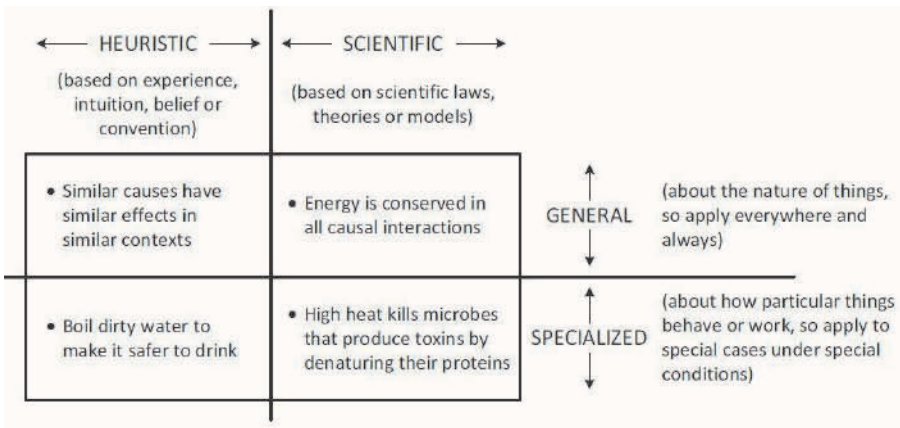
Although strong progress with any of these questions typically requires strong progress with 'earlier' questions in this series, it is also the case that progress with 'later' questions can provide insights that trigger significant revisions of 'earlier' work, so that this build-up of knowledge is more like a maturing system than a linear growth process. This 'feedback' loop is particularly evident in relation to general theories. Although general theories are concerned with foundational aspects of the discipline, their development requires much prior progress of specialized kinds, and hence scientifically significant general theories typically arrive late in the life cycle of a discipline. However, once they begin to appear they can trigger significant new work and important advances in specialized theories, which in turn can enable new advances in general theory development. They can even cause revision

of the domain boundaries, as happened in the separation of Chemistry from Alchemy and Astronomy from Astrology.

8- Scientific Principles for General Systemology

A ‘principle’ is a fundamental idea or rule that can provide guidance for making a judgement or taking action. Principles can take the form of injunctions, beliefs, concepts, assumptions, or insights. Principles can range from fully heuristic ones (distilled from experience, intuition, belief or convention) to fully scientific ones (distilled from scientific theories or models). Principles are encountered in every sphere of human activity, so we have for example principles relevant to ethics, aesthetics, economics, politics, science, engineering, agriculture, etc.

Fig. 14: Heuristic and Scientific Principles



Source: Rousseau et al. General Systemology

Examples of principles (Fig. 14) include the heuristic principle “do as you would be done by” and the scientific principle that “energy is conserved in all causal interactions”. Historically, principles start out as heuristics, and over time some become more scientific. As principles become more scientific, they become more useful for making apt judgements or taking effective action. By “more scientific” principles we mean principles that more strongly reflect the scientific approach, that is, use clear and precise concepts, express qualities

and relationships that can be subject to measurement, quantification, empirical verification or falsification, and so on. In this sense scientific principles can arise in philosophy, science, engineering and operational/service contexts. The scientific enterprise can be viewed as aimed at making principles across these domains increasingly scientific. All domains that seek to develop or employ such principles can be considered to be scientific disciplines, becoming more scientific over time as their principles become more so.

Both heuristic and scientific principles can be either general (applying universally, for example conservation of energy) or specialized (applying only in specific contexts, for example the principles of disease prevention). Note, however, that we make a distinction between “scientific principles” in the sense just explained and “science principles”, i.e., the principles underpinning science. It is a separate question whether the principles underpinning disciplines such as sociology, anthropology, economics, politics, or psychology are scientific or not.

The effectiveness of science depends on having strong principles underpinning scientific research methods, and the progress of science at a fundamental level (such as the discovery of new substances or new laws of nature) depends on having strong general principles. For example, specialized laws of nature, such as Boyle’s Law that states the balancing relationship between pressure and volume in an ideal gas, are instances of general principles such as that energy is always conserved or that effects have sufficient causes. General principles are powerful guides for exploring phenomena for which adequate theories do not yet exist.

8.1- What Are Systems Principles?

From the understanding of the nature of principles just presented we can now say that *systems* principles are fundamental rules, beliefs, ideas or insights about the nature or workings of systems, and hence systems principles guide judgment and action in systemic contexts. Systems principles will therefore exist in both heuristic and scientific forms, and in both general and specialized forms. Moreover, general scientific systems principles will have the same relevance for systems laws, and for exploratory systems research, as the relationship just described for the sciences more broadly.

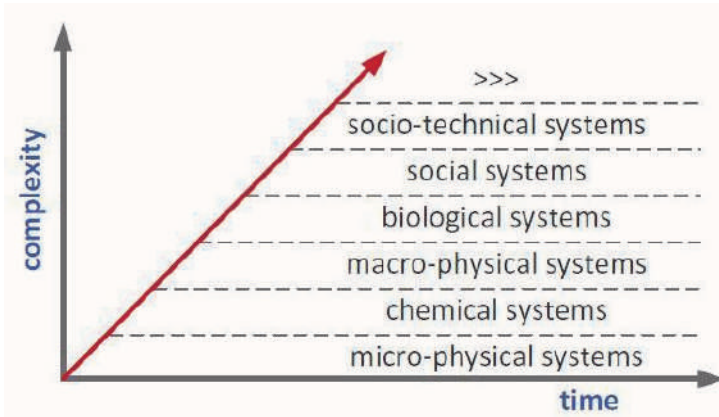
A starting point for thinking about Systems Science is the view that every concrete thing is a system or part of one, and that natural systems can be arranged into a “complexity hierarchy”, in which every level corresponds to some kind of system and the ‘levels’ represent increasingly complex systems embedding systems from the ‘lower’ levels, as shown in a simplified way in Fig. 15.

The system levels in the complexity hierarchy correspond to the subjects of concern of the mainstream specialized scientific disciplines, so it can be said that every specialized scientific discipline studies some kind of system. Note, however, that this does not make these disciplines systems sciences, since it is only trivially true that their subjects are systems. These specialized disciplines do not have as their subject matter systems *as systems* but rather they seek to understand instances of kinds of systems.

The idea of a science of systems arises from three reflections on the complexity hierarchy:

1. First, given that systems occur on every level of the complexity hierarchy, a science of systems must be about what is true of or possible for systems across all the levels. This is the insight behind the claim that System Science will be a trans-discipline, having relevance across the disciplinary spectrum, and will comprise theories that are scale-free and composition-independent. At a minimum, such a science must involve concepts and principles that allow systems to be recharacterized as a category of analysis distinct from things that are *not* systems, to enable instances of systems to be identified in the real world, and to explain/predict the behaviour and potential of systems as *systems*.

Fig. 15: Complexity Hierarchy of Natural Systems



Source: Rousseau et al. General Systemology

2. Second, when looking across the levels we find similar patterns recurring across multiple levels, for example spiral forms in certain tropical storms, seashells, flowers, and galaxies. Speaking metaphorically, these patterns represent solutions to Design problems that nature must solve to create enduring complex structures. The existence of these isomorphically recurring patterns across changes in scale and composition entails that there must be transdisciplinary specialized systems principles reflecting the nature of these solutions. In principle each of these patterns can be 'decoded' to establish a theory that explains the nature and function of the observed pattern, and to identify the relevant explanatory principles. Each of such theory would then be a specialized systems science theory, and we have several of these already (for example Control Theory, Hierarchy Theory, Network Theory, Communication Systems Theory, Theory of Dissipative Structures etc.). There are still many patterns in nature we do not theoretically understand. Moreover, it is likely that there are further patterns we have not yet identified.

3. Third, the isomorphically recurring patterns arise independently in multiple contexts involving different scales, compositions and developmental histories. This suggests that there are general systems principles that provide for the possibility of the *emergence* of these systemic patterns across contexts. Speaking loosely, these would be general principles about how Nature 'finds'

solutions, rather than (as above) specialized principles about how specific kinds of solutions work. We have very limited knowledge of such general systems principles, but in principle they hold the promise of a general theory of systems that would explain both the emergence of specialized patterns and the relationships between them. Such a 'general systems theory' (GST*) would be very valuable not only for unifying the body of specialised systems knowledge but also for opening up new routes to discovery.

8.1.1- The Role of General Principles in a Scientific Discipline

There are multiple terminologies and perspectives in science and in philosophy on the nature of the relationships between general principles, laws, theories, and models. For present purposes, we will follow a perspective called Scientific Realism, which is, presently, the dominant view amongst metaphysicians of science, is well matched to the working practice of practicing scientists and is consistent with the General Systems Worldview as discussed earlier. Briefly, Scientific Realism posits that a concrete world exists independently of our mental states, that the truth of our theories depends on the nature of the world, and that our best scientific theories are approximately true of the world. Within the framework of Scientific Realism, we propose following a model known as the "Principles- Laws-Theories" (PLT) model of modern science. For present purposes we will focus only on its notion of principles.

In science, general principles articulate the most fundamental assumptions we make about the nature of the world. They represent what we take to be true in general, and hence fulfil a number of orienting functions, including:

- (a)** Encapsulating what is deemed ontologically or metaphysically possible or inevitable (for example, the "Principle of Sufficient Reason", which claims that effects have proportionate causes, is a presumption against the occurrence of miracles);
- (b)** Setting bounds of scientific forms of reasoning (for example the "Principle of Uniformity of Nature", which claims that under the same conditions the same causes always produce the same effects, presents one way in which evidence can be linked to conclusions or predictions);
- (c)** Providing guidelines for doing science, (for example the "Energy

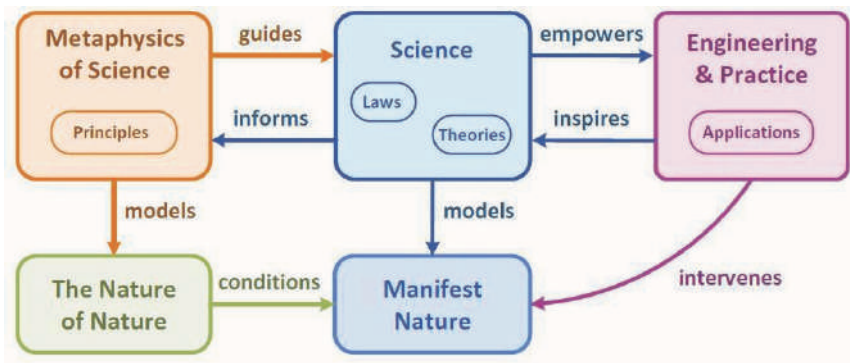
Conservation Principle” provides a way of checking that all the contributors to a given effect have been identified) and

(d) Defining basic concepts, for example, ‘energy’, ‘force’ and ‘atom’.

The principles of science are grounding *assumptions* and hence not provable by science. However, they are provisional and can be challenged and amended. Nevertheless, they are regarded as representing deep truths about the nature of the world, and their formulation and evolution is informed by progress in science. They express what we take to be the conditions for the possibility of the empirical phenomena observed by sentient beings. In this way the principles of science represent the invisible reality underlying the phenomenal one, and form part of metaphysics rather than science.

Taken together, the principles of science characterize the nature of Nature, so we might say that our image of the nature of Nature is the *gestalt* that reconciles the joint entailments of the principles (rather like the elephant image that reconciles the observations of the seven blind men). These relationships are illustrated in a simplified way in Fig. 16. Changes in the principles can have dramatic consequences for the scientific paradigm, for example what occurred when the Newtonian notion of “mass” was redefined by Einstein’s General Relativity theory.

Fig. 16: PLT model of modern science



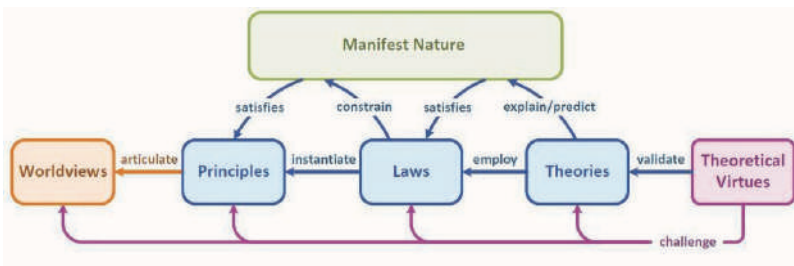
Source; Rousseau et al. General Systemology

Principles generally start out as qualitative heuristic principles based on limited observations, and later become exact, quantifiable and profound. For example, the (heuristic) Aristotelian notion of a force defined a force simply as a push or a pull, while the *scientific* notion from Newton was quantitative and carried profound implications, triggering the “Mechanical Revolution”.

8.1.2- The Interdependence of Principles, Laws, and Theories

Principles, laws, and theories interdepend systemically, and this conditions how they are discovered, used and evolve. The “PLT model” mentioned earlier captures these relationships well, as illustrated in Fig. 17 and explained below.

Fig. 17: Interdependence of Principles, Laws, and Theories



Source: Rousseau et al. General Systemology

The guiding principles for doing science, for example, that similar causes produce similar effects, express general assumptions or accepted general insights about the nature of the world, and therefore the general principles jointly form the most succinct expression we have of our worldview. Conversely, if we can describe our worldview, we can distil general principles from it. Once we can state the principles, we can apply them to observations of causal interactions to discover laws of nature, which are exemplars of the principles in specific contexts. For example, Boyle’s Law specifies how an increase in the pressure of an ideal gas will cause it to proportionately expand in volume, in conformance with the general principle that all effects have proportionate causes (under given conditions). Conversely, laws can be generalized to suggest new principles.

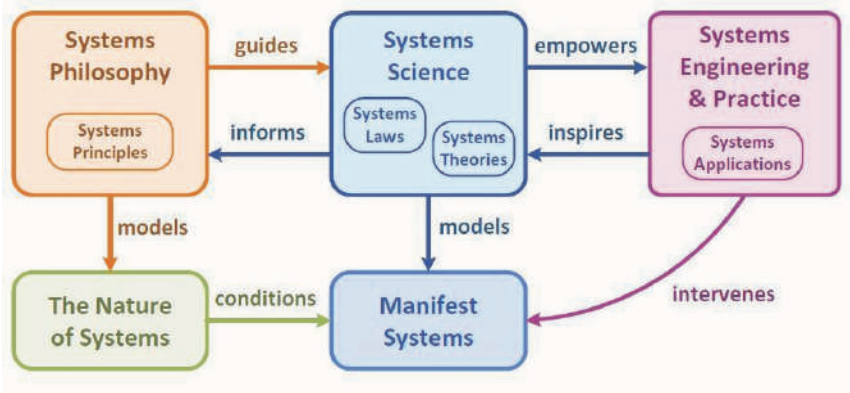
By applying laws, we have derived in this way observations of previously poorly understood phenomena, we can develop models and theories that explain or predict those phenomena. In practice there are often multiple ways of explaining the same phenomenon. To choose between them, competing theories or models are judged as to how “good” they are by evaluating them against “theoretical virtues” such as explanatory power, predictive power, simplicity, falsifiability, coherency, empirical adequacy, consistency with well-established theories. Philosophy of science has shown that theories that are ‘good’ in this sense are ‘better’ because they tend to last longer before they are superseded, are more likely to lead to new insights, are more likely to evolve into even more powerful theories rather than just be discarded, and so on.

If we cannot develop “good” theories about a given phenomenon, we must question the adequacy of the laws they employ; perhaps these need additions or refinements, or we need extra ones. To discover new or improved laws we must reflect on our principles, because laws are special cases of how the principles play out under specific conditions. By making further careful observations of the puzzling phenomena, and then carefully applying our principles, we might find better or further laws, which we can then use to develop more powerful theories and models. If despite these efforts we still cannot devise ‘good’ theories, we must then cast doubt on our principles. We generally refine or extend them by generalizing from laws we already have, or by distilling them from the assumptions entailed by our worldviews; so if we are questioning our principles, we have to consider both possibilities.

8.1.3 - The Nature and Significance of General Systems Principles

The content of Systems Science is distinct from that of the specialized sciences, but the structure of Systems science is likely to be no different from that of the rest of science. From this brief review we can thus form some idea of the scope and potential of systems principles. We can directly paraphrase the above discussion for the systems case as illustrated in Fig. 18.

Fig. 18: The PLT model for system science



Source: Rousseau et al. General Systemology

The correspondence between these two diagrams lies in the observation that Systems Philosophy models the systemic nature of the nature of Nature, and Systems Science models the systemic nature of manifest systems. General systems principles are the grounding assumptions of systems science, and hence not provable by systems science. However, they are provisional and can be challenged and amended. Nevertheless, they are regarded as representing deep truths about the systemic nature of the world, and their formulation and evolution is informed by progress in systems science. They express what we take to be the conditions for the possibility of the empirical systemic phenomena observed by systems thinkers. In this way the systems principles represent the systemic nature of the invisible reality underlying the systemicity of the phenomenal one, and form part of systems philosophy rather than systems science.

Taken together, the systems principles characterize the nature of systemness. A set of coherent and scientific systems principles would form the core of a foundational general systems theory (GST*), and changes in the systems principles could have dramatic consequences for the systems worldview. Once we have some principles in place for a scientific GST*, we would be able to execute a cycle of discovery, progress, and refinement in the context of systems science, in the same pattern as discussed above for the PLT model for science in general.

8.1.4 - Three General Scientific Systems Principles

8.1.4.1- The conservation of properties principle (CPP)

In chapter one we looked in considerable detail into the principle of *emergence* explained by Mario Bunge in his systemist ontology. He also dealt briefly with the issue of *submergence* in terms of the processes that lead to the dismantling of systems and concluded: *to understand the dismantling of a system we must understand the bonds that gave rise to it and have held it together. Shorter: Emergence explains submergence.*

Here we want to shed light on other analytical benefits of the process of submergence as expounded by Rousseau et al in their book “General Systemology”. They considered *submergence* as a general principle applicable to all systems and called it “*Conservation of Properties Principle (CPP)*”. CPP states that “*the energy associated with an emergent property in system formation is exactly matched by the sum of the energies lost by the parts participating in that systemizing interaction*”. More colloquially, this can be stated as “*emergent properties are exactly paid for by submerged ones*”.

This principle presents a valuable insight for systems research, system design and systemic intervention. It provides an empirical standard for demonstrating that an observed system property is an emergent one, by connecting it with submergence. This is important because it casts suspicion on the common practice of calling any property noted at the system level but not seen in the parts an emergent one. CPP suggests that if the balancing interplay between emergence and submergence cannot be demonstrated, then the analysis is incomplete or wrong. For example, the boundary of the system may have been drawn incorrectly, and the supposedly emergent system-level behaviour is actually due to the action of parts unwittingly left out of consideration, but which are in fact contributing that power to the whole in a summative way. Alternatively, the parts may have been mischaracterized, and have properties not currently attributed to them, and once again the system level property is summative rather than emergent. Either way research investigating the nature of a supposed emergent property will proceed differently from how this might be done without knowledge of CPP.

A further value is suggested via the idea that systems are dynamic structures, and so there is a constant interplay between emergence and submergence. This implies that when a system is suffering degradation due to loss of parts or weakening of inter-part interactions then we should be concerned not only about the loss of functionality but also about the re-emergence of previously inhibited behaviours of the remaining parts. This explains why it is so difficult to conserve or restore degraded or degrading complex systems, for example ecosystems. In systemic interventions both emergence and submergence must be managed, and lack of control in this management might imply that the wrong boundaries have been managed, or the boundaries and/or parts have been mismanaged. In this way systemic interventions and the design of resilient systems might now proceed differently from the way they would have been done without knowledge of CPP, and in particular this may help to reduce the occurrence or severity of unintended consequences.

It is not possible at this time to show that CPP applies across all systems types in the exact way the principle states, because we do not yet have a quantifiable scientific understanding of all the kinds of properties systems exhibit. This is especially notable in the case of living systems exhibiting mental or psychological properties. However, the principle does seem valid in a qualitative way, for example teams or families can achieve things the individual members cannot do by themselves, but members of such social units are also constrained in their behaviour compared to what they are able or willing to do in isolation. Some kind of balancing interplay seems to be in play here, as the willingness of an individual to accept constraints on their personal freedom seem to be dependent on the value they place on the benefits they gain through the powers of the social unit.

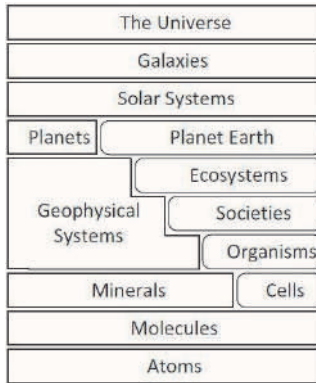
8.1.4.2- The Principle of Universal Interdependence

A common idea in systems thinking is that we can arrange naturalistic systems into a hierarchy by sorting things into kinds based on properties that are essential to being members of that kind, and then ranking them in order of complexity. One way of looking at this arrangement is to note that the things in every layer are composed of things that exist autonomously at the 'lower' level as shown in Fig. 19 overleaf. Fig. 19 also represents a containment hierarchy, so that the systems at every level not only contain parts from the lower levels ("sub-systems") but are also themselves embedded as parts in

higher-level systems (“super-systems”).

A core concept of systems thinking is that things not only have environments, but they are systemically connected into their environments. As a result, every concrete thing short of the universe is a part in at least one super-system. In this light it is obvious that, in accordance with CCP, it must be the case that system properties are not only emergent over the properties of the parts but are themselves subject to submergence because of their integration into their super-systemic context. This entails then that in fact systemic properties are determined by a balancing act between the bottom-up influence due to the parts and the outside-in influence of the super-systemic context. This provides a second systems principle, which Rousseau calls the “*Principle of Universal Interdependence*”, and paraphrases as “system properties represent a balance between bottom-up emergence and outside-in submergence”.

Fig. 19: Natural Systems Hierarchy



Source: Rousseau et al. General Systemology

It is worth noting that this principle reflects a different idea from the statement often made for systems that they cannot be explained reductionistically because they involve an interplay between “bottom up” causation and “top-down” causation. That view is about how emergent properties can act back onto the parts, for example mental properties which might emerge ‘bottom up’ via brain complexity can then influence processes within the body via will-power and bio-feedback. This kind of claim is not to do with a system’s

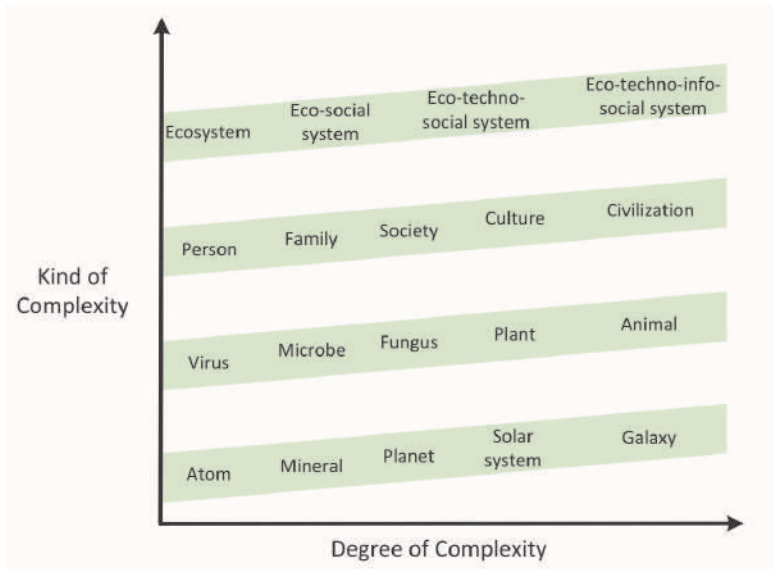
environment but is rather just a more sophisticated view about the goings-on within the system boundary.

The Principle of Universal Interdependence has significant implications for science. It entails that to model a system's real potential one must look not only at what the parts contributed (bottom-up causation) but also what was deduced by the super-systemic context (out-side in causation). It means the explanatory arrows go both ways, both down and up from the system boundary. From a philosophy of science point of view this replaces classical "down-ward only" reductionism with a type of holistic interdependence perspective. For scientific research, this then suggests that for a theory about any new phenomenon the explanatory burden is expanded to now include both bottom-up and outside-in influences, and to do so in a balancing way. This principle also has significance for planning interventions and system designs because it implies that there are two interconnected kinds of leverage points for changing system capacity/behaviour, namely via modulation of either the bottom-up or the outside-in influences.

In addition, this principle contributes to epistemology, by adding a new theoretical virtue: theories and designs will be "better" if they are more holistic. An interesting prediction follows from this suggestion, namely that all the specialised disciplines will become more holistic as they mature. This is already happening in several fields, most notably at this time in cosmology, biology, and medicine. It is therefore likely that a future systems engineering will not only be holistic itself but will increasingly be able to draw on holistic specialised sciences for support.

8.1.4.3- The Principle of Complexity Dominance

Fig. 20: Kinds and degrees of complexity in systems



Source: Rousseau et al. General Systemology

We previously discussed how different kinds of systems can be grouped into a levels hierarchy, as shown in Fig. 19. This represents a type of complexity hierarchy, where the systems at each higher level have a new kind of behavioural property that emerges due to their higher level of organizational complexity. These levels represent not just an increase in complexity but shifts to new *kinds* of complexity. On this view biological systems thus appear 'higher up' in the system levels hierarchy than chemical systems because their increased behavioural variety is due to their having a radically different kind of complexity.

However, there is also another aspect to complexity depicted by Fig. 20. Here, on the left-hand side we see a hierarchy of physical systems ranging from atoms to galaxies. This also represents some kind of complexity hierarchy, but here an increasing 'degree of complexity' enables the establishment of ever larger enduring structures by combining smaller assemblies of a similar kind

in special ways. Large-scale systems of a certain kind are thus distinguished from small scale systems of the same kind by having a higher *degree* of complexity. This is the case for systems of all kinds, so we can illustrate the interplay between these two dimensions of complexity as shown in Fig. 24. Note that both dimensions of complexity are involved in the evolution of new system types, as is suggested by the sloping levels. An increase in scale does entail some increase in the level of behavioural complexity, but not of such a radically different kind as is required for producing a wholly new kind of system behaviour.

With this distinction in mind, we can now proceed to examine the third general principle of systems which we call the *principle of complexity dominance*. We will only look at a differential in the degree of complexity and not differentials in kinds of complexity. This might be taken to imply that the principle would only apply within system levels (that is, between systems sharing the same kind of complexity), but it can indeed be applied when interactions *across* system levels are at stake.

Consider a super-system (W) consisting of two sub-systems, one of high complexity (S1) and one of low complexity (S2). The interactions between S1 and S2 bind them into the super-system (W). As a new system W has emergent new properties, and by the Conservation of Properties Principle (CPP) both S1 and S2 must undergo some degree of submergence. The binding interaction that links the two subsystems together is the same for each, but the relative impacts are unequal. A simple example will make this evident. Take for example the impact of gravitational attraction between a very small body and a large one, such as a meteoroid passing a planet. They form a system and each falls towards the other in accordance with Newton's Law of Gravity, but the effect on each is very different: the meteoroid's behaviour is strongly conditioned by the nearby planet, but the planet is hardly affected.

The interaction force is the same for each of the interaction partners, so it follows that they each give up the same amount of (gravitational potential) energy, so they contribute equally to the emergence of the new whole. In terms of CPP, we can say, speaking colloquially, that they each pay the same amount towards the emergent property of the whole, but the complex subsystem can afford that payment more easily, so is less affected by it. In a simple subsystem

like S2 the few parts each have to give up a lot of their energy to make up their contribution to the total, but in a complex subsystem like S1 the many parts each give up a relatively small amount to make up their contribution. In line with the energy conservation aspect of CCP this conclusion can be generalized by saying that in systemizing interactions complex parts pay proportionately less towards emergent properties of the whole than simpler parts do. This amounts to a new systems principle, which Rousseau has called the “*Principle of Complexity Dominance*”. It states that the impact of submergence on a part is proportional to the complexity differential between the part and the whole and can be paraphrased as “complexity buffers autonomy”.

This principle has relevance for scientific research, because it implies that when modelling the nature and potential of a given system the two explanatory arrows (‘bottom up’ and ‘outside in’) differ in weight in proportion to the relative complexity of the target system compared to the other systems making up the super-system it is systemically interlinked with. This is an important consideration in the study of naturalistic systems because they cannot be completely shielded from systemizing interactions. This principle also applies to the behaviour and performance of designed systems, as they, like natural systems, are always parts in super-systems. This principle is also relevant for planning systemic interventions, because the two inter-related leverage points for modulating system behaviour would be unequally weighted if there are complexity differentials involved.

We conclude this section and this chapter by stating the four general systems principles that seem to be agreed upon by system theorists:

- 1- The principle of emergence
- 2- The principle of *conservation of properties*
- 3- The principle of *universal interdependence*,
- 4- The principle of *complexity dominance*

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Chapter Three

Systems Approach to the Integration of Knowledge: **THE METHODOLOGY**

This chapter is a summary of the relevant parts of the useful and comprehensive account of the approach of *systemism* as applied to the social sciences given by Wan in his book “Reframing the Social”⁶. We have briefly discussed in chapter one on ontology Mario Bunge’s systemism as representing his systems ontology and methodology. Bunge summarized his approach to studying systems in his CESM (composition, environment, structure, mechanism) model, where he emphasized the importance of the mechanism-based explanation of reality because it is the actual practice of scientific research as conducted by researchers in the natural sciences. Since the furniture of the world is composed of integrated systems then systemism, as the only viable approach to studying systems, should also be adopted in the study of social reality.

1- Causality in Social Science

Bunge uses the term mechanism to mean the collection of processes that make a concrete system “tick”. The notion of mechanism is not merely intimately linked to that of system; it is the key to the workings of a system. As Bunge emphasizes, these two concepts are so central in modern science that their use has spawned a whole ontology, namely what he calls *systemism*. It is, therefore, important to have a close look at the concept of a mechanism and its relationship to causality and explanation in social science.

Much of the practice of natural science can be understood in terms of the

6 - Poe Yu-ze Wan (2011): Reframing the Social. Ashgate Publishing limited. Surrey, gu9 7Pt; England.

discovery and description of mechanisms. However, only a few general expositions of the concept of social “mechanism” and its implications for social research have been published and discussed in journals, books, and conferences. Besides, social scientists from different fields and countries have also conducted empirical studies and provided compelling explanations of their research findings by adopting a mechanism-based approach. This has led several leading scholars to stress that within political science and sociology, the identification of a specific mechanism - a causal pathway - has come to be seen as integral to causal analysis, regardless of whether the model in question is formal or informal or whether the evidence is qualitative or quantitative.

Almost all the significant features of the methodology of recent science rest ultimately upon knowledge of unobservable *causal powers* and *mechanisms*. Since the discussion of mechanisms in philosophy of social science goes hand in hand with the notion of causal powers, it is obvious that the two concepts of *causal power* and *mechanism* are tightly related. Put differently, the mechanism-based explanation is rooted in a *realist* approach to the question of causality, which brings into sharp focus such concepts as causal powers and capacities. But what is meant by a “causal power”? To what extent is the realist notion of causality different from others? Why is it of paramount importance for our understanding of the mechanism-based causal reasoning and explanation in social science?

The mechanism approach to causality and explanation is rooted in the realist tradition, which is in direct conflict with the *regularity* or *succession* (or *successionist*) theory of causality associated with empiricism, and more specifically, with the positivist model of explanation, notably the Popper-Hempel covering-law (or deductive-nomological) model. The empiricist theory of causality is based on certain interpretations of the views of Hume, for whom a cause is simply “an object precedent and contiguous to another ... where all the objects resembling the former are placed in relations of precedency and contiguity to those objects that resemble the latter.” (Quoted by Wan, 117). From the perspective of the Regularity View of Causation *c* causes *e* if

- a. *c* is spatiotemporally contiguous to *e*;
- b. *e* succeeds *c* in time; and

c. all events of type *C*, i.e., events that are like *c*, are regularly followed by, or are constantly conjoined with events of type *E*, i.e., events like *e*.

Furthermore, within this tradition, causation is a notion we infer through “custom”, or imagination from experiencing certain events in succession. In sum, a cause is just what usually comes before an event or state, and which comes to be called its cause because we acquire a psychological propensity to expect that kind of effect after the cause. The *idea* of necessary connection is a psychological trick played by the mind that observes repetitions of causes followed by effects and then presumes some connection that goes beyond that regularity. On such a view, causation involves only empirical regularities among observable events, while statements about causal mechanism, causal power, causal necessity, or causal ontology – which are by and large unobservable, or at least not directly observable, are all discarded as irrelevant.

The most important approach to causality that runs sharply counter to the Humean tradition is what is called the *generative* theory that characterizes the realist approach to causality. While the regularity accounts, whether simple or complex, follow Hume in shunning *causal powers* and *causal connections*, the generative theory of causality construes materials and individual things as having causal powers which can be evoked in suitable circumstances. For realists what is important in tracking causal connections is not identification of law-like regularities of empirical observables but, rather, the description of the real properties, structures and generative mechanisms that underlie the actualization of events and their empirical observations.

Since the 1960s and 1970s, different versions of realism have come to subvert the prevailing positivist/ empiricist philosophy of science, giving rise to the deeper realist insight that scientific theory is ontologically driven, and that ontology is about natural kinds of powerful particulars. These particulars are “powerful” in the sense that they possess causal powers or generative capacities. To say that ‘*X* has the power to *A*’ means *X* (will)/(can) do *A*, in the appropriate conditions, in virtue of its intrinsic nature. In the Humean successionist theory of causality, things are regarded as passive and having no power, and all changes come from without. In contrast, for realists, the world is understood as an interacting system of powerful particulars, and their interaction results in the patterns of events and ensembles of properties, that is,

the multitudinous phenomena of the world we experience. Importantly, these powerful particulars are forceful objects at work, or causally active things, rather than passive, powerless ones.

Inherent in this conceptualization is the view that there is *necessity* in the world; objects - whether natural or social - necessarily have particular causal powers or ways of acting and particular susceptibilities. Central to the philosophical realist accounts is the reinstatement of the notion of *natural necessity* between causes and effects. Causes, for the philosophical realists, are real ontological entities that ontologically necessitate their effects: causal necessity is not “logical” but “natural”. It is capacities that are basic, and laws of nature obtain - to the extent that they do obtain - on account of the repeated operation of a system of components with stable capacities in particularly fortunate circumstances.

Saying that some X has the capacity to Ψ tells us something about what X does *potentially*: When X operates unimpeded, it produces Ψ . However, even when this process is interfered with, X will tend to or try to do Ψ . In other words, if there are causal factors present that impede on X 's action to do Ψ , X will still contribute to the overall result. Secondly, the ability of X to Ψ must be stable across some range of circumstances if it is to count as a capacity. There are real causal powers underlying causal relations and that to possess a causal power means to have a capacity to produce a certain kind of outcome in the presence of appropriate antecedent conditions. The successionist and generative approaches to causality differ most widely over whether they admit causal powers or agents into their view of the world. Realism stands foursquare behind the generative model of causation, the defining feature of which is to look for causal powers within the objects or agents or structures under investigation.

For realists, what science tackles is a “dappled world” that consists of things that possess characteristics which have tendencies to interact in particular ways with other things. The task of science is, therefore, to attempt to discern the nature of things, to identify their characteristics and tendencies of interaction. In the realist framework, “causes” are not understood in terms of events, states of affairs or variables as in the positivist social science, but are seen as those things, forces, powers, mechanisms or sets of relations that make

things happen or 'trigger' events. Only in the artificial conditions created by nomological machines do we see the real manifestation of a capacity in a strict regularity. Causal laws are results of extreme abstraction, not merely approximating idealizations, and therefore are best seen as laws about capacities and tendencies. It is in this context that realists usefully understand laws as *tendencies*. As Bhaskar (1989) famously puts it, "causal laws must be analyzed as tendencies, which may be possessed unexercised and exercised unrealized, just as they may of course be realized unperceived (or undetected) by anyone."

The following issues should be taken in consideration when opting for the realist alternative to causal explanation:

Firstly, some authors in the critical realist tradition make no distinctions between causal powers and emergent properties and it remains ambiguous whether all of the causal powers of complex things can pass for emergent properties. While emergent properties are causal powers, the reverse is not true. For example, mass is widely regarded as a causal power, since the mass of a body is a measure of its capacity to change the motion of other bodies, i.e., to cause state changes. Thus, having mass means having a 'causal power'. But mass is the typical example of a resultant property, that is, the property of a system that is possessed by its parts in isolation or in an unstructured aggregation. Therefore, only when a causal power of a concrete system can be shown to be an emergent property relative to the properties of the system's constituents, can it be properly called an "emergent causal power".

Secondly, some realists seem to believe that both *things* and *events* have causal capacities to bring about other events or states. However, events do not possess causal powers, only things and stuffs.

Thirdly, what is the relationship between properties, powers and things? A useful point of departure is Bunge's materialist view that "there are no properties in themselves, located in a Platonic realm of ideas: every property is possessed by some individual or *n*-tuple of individuals" (Bunge 2003). The same can be said of powers: "Powers are always powers of, or powers possessed by, something". No things, no properties, and no powers. Then how do we conceptualize the relationship between properties and powers? Bunge (2006) writes that "a property of a thing may be said to be actual or manifest if the

thing possesses it, and potential or dispositional if [it] emerges under suitable circumstances". More specifically, the dispositional property, identical to what other realists call causal power, "is a property actually possessed by a thing that, under appropriate environmental conditions, generates another property" (Bunge 2006).

On this view, two kinds of properties of something must be distinguished - manifest, e.g., *change*, *bending*, and *being broken* and dispositional, e.g., *mutability*, *plasticity* and *fragility* - although in fact they are two sides of the same coin. Therefore, it would be problematic to use "emergent properties" and "causal powers" interchangeably as if they were the same thing. For example, the cohesiveness of a social system, say, an army, is an emergent, but nonetheless *manifest* property, while the ability to act in a self-disciplined and united way may be said to be a dispositional property (causal power) of an army. It is advisable to take the view that things, properties, and powers cannot be ontologically disaggregated because they form a unity, while we often refer to this unity via one of its members. It is, therefore, incumbent upon social researchers to use these philosophically puzzling concepts more carefully.

It is against this background that the ascription of causal powers to "social structures" by Bhaskarian realists, often referred to as "social realists" or "sociological realists" has generated profound disagreements among critical realists. Non-Bhaskarian realists are highly critical of the way "causal power" is used in discussions on social structure, which they believe runs the risk of reification as the illicit attribution of agency to entities that are not actors or agents. The concept of causal powers should be confined to those complex things, or powerful particulars, which *do* things by dint of their intrinsic nature. Since it is beyond doubt that only social persons are powerful particulars capable of exercising causal powers, and that structures can only be effective in terms of the agency of persons, it follows that social structures cannot be granted an independent ontological status.

As Bunge (1998, 1999) reminds us, every structure is a property of a system, not a *thing*. In Bunge's CESM model of society, therefore, "social structure" stands for the set of relations among the members of a given social system and among these and items in the system's environment, while the *total* social structure of a society is defined as "the union of its biological, economic,

political, and cultural structures” (Bunge 1998). To stress again, since social structure is a *set*, or *collection* of relations, it is a *concept*, not a concrete thing such as an organism, a person, or a group. “Sets and relations do not consume or produce, cooperate or fight: they are no more and no less than concepts” (Bunge 1996).

For Bunge, it is “social systems” that have emergent properties and thus causal powers, while “social structure,” such as the division of labor, *is* a significant emergent (systemic) property of social systems. In this sense, the relations among a system’s constituents can be seen as an emergent causal power of that system. Therefore, Bunge argues that it is misleading to refer to “social systems” and “social structures” interchangeably, as social realists often do in their attempts to attribute causal powers to whatever elements that emerge from human interactions.

It is perfectly sensible to maintain that social entities such as organizations and normative communities, composed of people, have the causal power to influence the behavior of human individuals. More specifically, these social entities are concretely structured groups and collectives, and perhaps combinations of these, that function as relatively enduring dynamic social systems, in which we find interrelated individual agents who communicatively interact with each other in relatively stable ways by using symbols, material resources, and material artefacts. Therefore, the real question does not lie in *whether* these causal powers exist, but in *how* the causal powers possessed by a concrete social system influence those outside and within it.

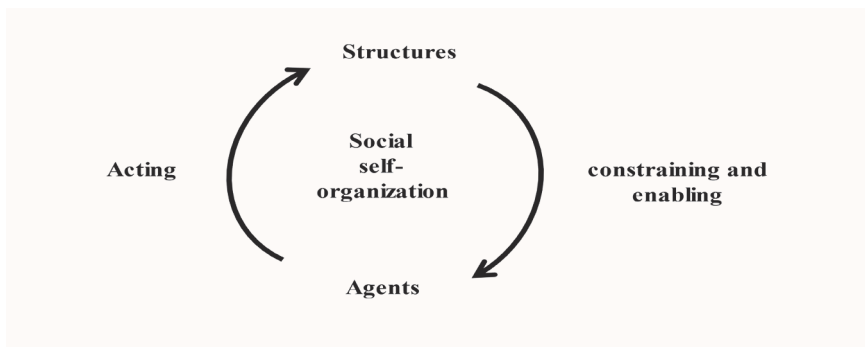
Social structures are not powerful particulars, and therefore they do not “produce” changes in the efficient cause sense. Instead, they *contribute* to (1) the formation of individuals’ beliefs, preferences, intentions, and dispositions, and (2) the emergence of various types and scopes of social actions taken by individuals or supra-individual entities, which in turn “produce” or “generate” changes in the social world. It is always important to examine how the ‘meanings’ and ‘ways of conceiving’ that are dominant come to inform the intentions and the actions of agents. In other words, both ideational and material aspects of social structures need to be considered to create a more comprehensive view of the causal roles of social structures.

Social structures, understood as social relations, are characterized by *rules* (in

a broad sense, referring to, e.g., conventions, norms, shared understandings, mutual expectations, collective intentionality, etc.) and certain modes of access to *resources* (including authoritative and allocative resources, that is, control over persons and control over things). The former shapes and conditions, i.e., enables and constrains people’s beliefs, preferences, intentions, dispositions, and strategies of actions, etc., thus encouraging some actions and discouraging others. These actions in turn contribute to the behavior of some social systems that behave as units in some regards or, in other words, as coherent, durable, self-propelling social units such as firms. As for the modes of access to resources, they set limits to the range of options available to a social agent (an individual or a supra-individual entity) regarding the ends or the means. In brief, they define the scope and means of social agency. Therefore, while social structures are not powerful particulars that can produce observable effect(s) in certain conditions and in a relatively autonomous way, they are arguably capable of motivating or discouraging, constraining, and enabling certain sorts of human action - see Fig. 1. To put it in a counterfactual manner, they bring things about which, if they were different, would not occur in the same way.

A useful Marxist definition of social structure is provided by Callinicos (2006): “a *relation* connecting persons, material resources, supra-individual entities (social institutions of some kind), and/or other social structures by virtue of which persons ... gain powers of a specific kind”. This conceptualization has several advantages:

Fig 1: Self-organization of Social Systems



- (1) it conceptualizes structure in terms of *relations*;
- (2) the relata of these relations are not necessarily individual persons, so that sufficient room is left for supra-individual entities;
- (3) agency does not disappear in this analytical framework, because structures defined in this way confer specific causal powers on the agents (individuals and supra-individual entities alike) involved in the relations.

The approach to causality based on causal powers or capacities, with an appropriate emphasis on the causal roles of social structures, as formulated above, is closely tied to - or lends ontological support to - the mechanism-based explanation in social science. The central idea of causal ascription is the idea of a causal mechanism: to assert that *A* causes *B* is to assert that there is a set of causal mechanisms such that *A* in the context of typical causal fields brings about *B* (or increases the probability of the occurrence of *B*). A causal mechanism is a series of events or processes that lead from the explanans to the explanandum. This approach may be called "causal realism," since it rests on the assumption that there are real causal powers underlying causal relations. It is now time to explore in more depth how the mechanism-based explanation fares in social science.

2- Mechanismic Explanation in Social Science

Social scientists in the realist tradition are generally opposed to the empiricist/positivist conceptualizations of causality as event regularities. Or more precisely, they resist the idea that there is no causality in nature, over and above the constancy with which events of one kind are followed by events of another kind. For them, the empiricist rejection of metaphysics, as well as the concomitant shallow understanding of causality, inclines a positivist social scientist to banish from science the research of the causes or the generative mechanisms of phenomena. Since the interpretation of a statistical table or of a set of statistical tables seldom ends with a causal analysis, to go into a deep explanation one has no choice but to go beyond the statistical relationships to disclose the generative mechanisms that bring them about.

Therefore, realist social scientists have made strenuous efforts to bring to the fore:

1. The role of (generative, causal) mechanisms and causal powers in social scientific explanations, or the idea of causation as *generative process*.
2. The “mode of production of phenomena”.
3. The “problem of transformation” from individual actions to collective phenomena, which amounts to the question of the mechanisms of social emergence, as well as the “bridge problem” or “bridge assumptions” that concern the influence of social conditions on individual actions.

In other words, social researchers have to move beyond the statistical relationships among variables on which the standard positivist analysis mainly focuses and reflect upon their empiricist conceptions of causality. The statistical analysis serves as a *test* of an explanation rather than the explanation itself. The narrow conception of causality inherent in quantitative empirical sociology, e.g., the dominating idea of “causation as robust dependence” firmly grounded in the Humean stress on the constant conjunction of events, and the resulting neglect of the notion of generative mechanisms, seriously undermine the explanatory capacity of the quantitative approach to such an extent that the latter is reduced to being a largely descriptive activity.

But what exactly does an explanation based on causal mechanisms amount to?

To explain is to give information about the mechanism linking cause and effect. If we explain why smoking causes cancer, we do not give the cause of this causal connection, but we do give the causal mechanism that makes it. The “scientific realist” school of thought has emphasized that causal mechanisms - independent stable factors that under certain conditions link causes to effects - are central to causal explanation. Causal realists usually require that:

- (i) causation is objective, in the sense of being ‘physically’ out there and not merely a feature of our thoughts or perceptions alone, and
- (ii) the relation between the cause and the effect is a necessary relation. It is also commonly agreed that causal realism is the view according to which the cause and the effect are linked by a causal mechanism.

It can, therefore, be argued that the proponents of mechanism-based explanation share a common maxim that “correlation is not causation,” and they make imperative the need to think carefully about the generative component of an argument - the pathway(s) through which X might affect Y. They have in common “an emphasis on making intelligible the regularities being observed by specifying in detail how they were brought about”. Scientific realists attribute an ontological status to causal mechanisms, as Bunge construes mechanisms as the *real*, though not always directly observable, processes taking place in systems and keeping the systems going. It is, therefore, of importance not to slip into the confusion between a factual item such as a mechanism, and any of its models. Causal mechanisms are ultimately unobservable physical, social, or psychological processes through which agents with causal capacities operate, but only in specific contexts or conditions, to transfer energy, information, or matter to other entities.

2.1- The Mechanical Connotations of Mechanism

It should be stressed from the outset that when the term “mechanism” is invoked in a causal explanation, it is not understood in any mechanical sense. In ordinary English this word [mechanism] has two distinct meanings. Sometimes it means mechanical contrivance, a device that works with rigid connections. Sometimes it means any kind of connections through which causes are effective. So, we must firmly grasp the idea that not all mechanisms are mechanical. Bunge (2004) also makes it clear that there exist, thermonuclear, thermo-mechanical, electromagnetic, chemical, biological, ecological, social, and many other mechanisms as well. This kind of explanation is usually called *mechanistic*, but Bunge prefers to call it *mechanismic*, because most mechanisms are nonmechanical.

2.2- Clarifying the Terms Used in Mechanismic Explanations

A number of proponents of the mechanism-based explanation in natural and social science include both the *processes* that make an entity causally efficacious and that *entity itself* into their definition of mechanism. Exceptions exist, however, in which the concepts of systems (entities) and mechanisms are kept distinct: Causal mechanisms are ultimately unobservable physical, social, or psychological *processes* through which agents with causal capacities operate, but only in specific contexts or conditions, to transfer energy, information,

or matter to other entities. In so doing, the causal agent changes the affected entity's characteristics, capacities, or propensities in ways that persist until subsequent causal mechanisms act upon it.

Reinterpreted in Bunge's terms, this approach brings into focus the need to recognize:

- (1) concrete systems (powerful particulars),
- (2) their mechanisms, which are responsible for the emergent causal powers and specific functions of these systems, and
- (3) the complex interaction between these powerful particulars in a mechanistic explanation.

The strength of Bunge's CESM model is that it clearly distinguishes between "system," "structure" and "mechanism" by defining them in relation to one another. Such a conceptual distinction is of overriding importance "not only for theoretical but also for practical reasons, since one may wish to preserve or alter the structure of a system without altering its mechanism, as when a state enterprise is transformed into a private company offering exactly the same products or services" (Bunge 2004b). That is to say, the conflation between system and mechanism tends to be detrimental to the study of concrete systems. As Bunge (1999) notes: "Mechanism is to system as motion is to body, combination (or dissociation) to chemical compound, and thinking to brain." He further argues that the distinction between system and mechanism "is familiar in natural science, where one is not expected to mistake, say, the cardiovascular system for the circulation of the blood or the brain with mental processes" (Bunge 1999). Furthermore, the critical task is often to unveil the *essential* mechanism of a system, that is, its peculiar functioning or activity (Bunge 2006a).

Wan suggests that two research strategies proposed by critical realists are highly relevant for anyone interested in providing a mechanism-based explanation of macro-social events and phenomena: *retroduction* and *retrodiction*. Retroduction is the process of identifying the causal powers that influence social events, the entities that possess these emergent properties and powers, and the mechanisms underlying them, while retrodiction pertains to ex-

plaining how all of these, under certain contexts, combine and interact to produce the events in question, or in other words, working out the way in which known causes must have been triggered and interacted with one another for some concrete phenomenon to have materialized.

2.3- The Micro-foundations of Mechanism-based Explanations

Are mechanism-based explanations necessarily micro-foundational? A mechanistic explanation generally has to do with certain forms of part-whole relations whether the object of explanation is the working of a concrete system, or an event/phenomenon that involves interacting concrete systems and their emergent causal powers. In this sense, to say that a mechanism is invoked in a causal explanation typically means that certain details at a lower level of organization are specified and, therefore, certain sorts of micro-foundations for the causal claim are provided, or that a cross-level, e.g., macro-micro-macro explanatory strategy is pursued. In other words, mechanistic explanations are “deep” insofar as they integrate levels of analysis by performing micro-reduction. However, the micro-foundations of a social explanation need not be built exclusively at the level of *individual persons*, because:

Firstly, for *pragmatic* reasons, it is often not possible to go down to the level of individual behavior to account for macrolevel phenomena when, for example, suitable long-term data that contain information about individual actions, desires and beliefs are difficult to obtain or even unavailable. “Explanatory efficiency” may be a useful term to characterize these “pragmatic reasons”. In practical research, a minimum of explanatory efficiency is always required, and it is sometimes the case that explanations on the social level are preferable because of the efficient way in which they provide us with the explanatory information required, even though an explanation on the individual level is possible in principle. Of equal importance is that research efficiency is not pursued to the point that the aim or quality of explanation is compromised. Rather, the acceptable level of generality of hypotheses on causal mechanisms will vary depending on the particular research question and research objectives under investigation.

Secondly, there is the “infinite regress” question: If we have to provide individual-level mechanisms to confirm all macro-sociological causal claims or to “complete” the causal explanation, why stop there? Why don’t we

also provide all the relevant neurological and biochemical mechanisms that bring about individual behavior? This would leave *individualist* accounts unconfirmed as well. Therefore, it should be borne in mind that even when mechanisms are useful, nothing requires that they be individualist in nature - often the most obvious level of disaggregation is to further social entities such as groups or organizations.

However, this is not to deny the desirability and usefulness of explanations based on individual-level mechanisms. It makes perfect sense to invoke individual-level mechanisms when:

1. our macro-sociological claim is weakly confirmed;
2. that claim makes specific *assumptions* about individual behavior; and
3. we already have a well-confirmed account of individual behavior.

More importantly, it is one thing to say, reasonably, that there is no such thing as pure social causation from macro-state to macro-state, or that there are no social causal mechanisms that do not supervene upon the structured choices and behavior of individuals, but quite another to suggest that there exist no macro-level mechanisms. Macro-level mechanisms, such as “evolutionary selection”, “socialization”, “competition”, “political participation”, “racial discrimination” and the “rule of law” do play a significant role in social scientific explanation, and they can be ascribed unique ontological status in many cases. It is undeniably true that these macro-level mechanisms ultimately depend on the structured choices and behavior of individuals but (1) this does *not* entail that every adequate *description* of a social mechanism must be phrased in individualist terms; (2) when certain individuals and supra-individual entities act and interact consistently and stably enough, such macro-social mechanisms emerge and persist (within limits), and can thus be unveiled, described, and modeled. This leads Bunge (1999) to state that “social mechanisms reside neither in persons nor in their environment - they are a part of the processes that unfold in or among social systems”.

Researchers should not favour mechanistic explanations that privilege *cognitive* (or *dispositional*) mechanisms at the expense of a wide range of “significant cause-effect connections,” including those involving *relational*

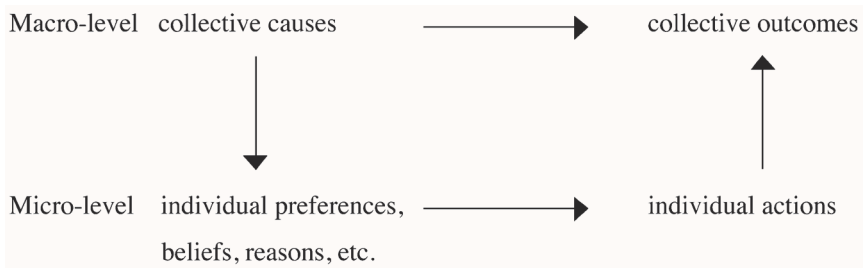
and *environmental* mechanisms that do not have any necessary connection to individual-level cognitive mechanisms. In advancing his systemic approach Bunge (2003) stresses that it is not enough just to point out the context or circumstances of a social fact, since “social scientists are expected to study social bonds in addition to social contexts, for bonds are what hold systems together, and their weakening is what dismantles them”. Bunge (1998, 1999, 2006a,) himself also writes of such macro-social mechanisms as consumerism, economic stagnation, ethnic conflicts, deindustrialization, democracy, social cohesion, free trade, “economic and political segregation”, technological innovation, price formation, and so on, all of which make no explicit reference to the level of individual persons, but nevertheless satisfy his definition of a social mechanism as “a process involving at least two agents engaged in forming, maintaining, transforming, or dismantling a social system”.

Finally, concerning the ontological status, e.g., the emergent causal powers of supra-individual entities such as groups and organizations, even if epistemologically these macro-social mechanisms can in principle be explained by individual-level beliefs, actions and interactions, this does not justify the sweeping conclusion that there exist no macro-level entities and the corresponding mechanisms.

2.4- The Distinctions and Relations Between Mechanisms in Social Explanation

Analytical sociology attempts to explain complex social processes by carefully *dissecting* them, bringing into focus their most important constituent components, and then to construct appropriate models which help us to understand the social phenomena we observe. A macro social phenomenon (M) can be described as a function of individual actions (m), which are in turn functions of a social structure (S) that constitutes the situations of the actors, while this structure is also a function of a specific set of factors at a macro level higher than S (M). This explanation exemplifies the following two-tier causal chain, which Bunge calls the *Boudon-Coleman diagram* - see Fig. 2.

Fig. 2: Boudon-Coleman diagram



Source: Wan. Reframing the Social

Analytical sociologists make the distinction among “macro-micro” (*situational*), “micro-micro” (*action-formation*), and “micro-macro” (*transformational*) mechanisms. The situational mechanism denotes a specific social situation that affects the actor(s) in a particular way. This *social situation* involves three aspects:

- (1) the available alternatives to the actors;
- (2) the restrictions that regulate the choice of the alternatives; and
- (3) the evaluation of the possible consequences of the choices made

The situational mechanisms help to identify what aspects of society and what aspects of an individual’s development and life-history are relevant as cause of the causes in the broader explanation.

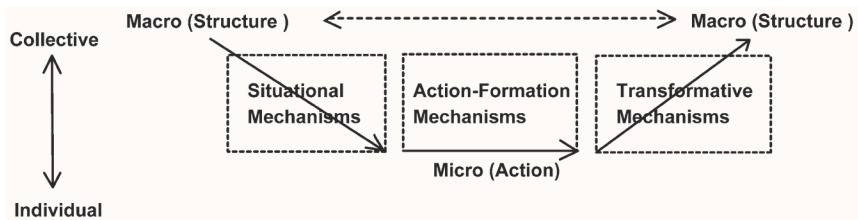
The *action-formation* mechanism involves a multiplicity of psychological and social-psychological mechanisms, e.g., the well-known “framing effect” studied by psychologists and particularly social movement researchers, or preference adaptation that operate at the micro level, which demonstrates how a specific combination of individual desires, beliefs, and action opportunities generates a specific action.

Finally, the *transformational* mechanism, or what can be called the “logic of aggregation,” specifies or reconstructs the processes whereby the *purposeful* actions and interactions of individual actors give rise to the intended or

unintended macro-level outcomes one seeks to explain.

Analytical sociologists believe that only an analysis of this kind that studies these three “logics” or mechanisms and their relationships will provide a satisfactory sociological explanation. They call such an approach “complex methodological individualism” or “structural individualism” - see Fig. 3 below.

Fig. 3: Structural Individualism



Source: Wan. Reframing the Social

Such a model attempts to represent the “complexity of the mechanisms” underlying the macrosocial regularities that the sociologist wishes to explain, and not just to describe. As opposed to traditional methodological individualism, it captures the “mechanisms of complex aggregation”, with attention thoughtfully paid to the interdependence between the entities constitutive of a system as well as the phenomena of emergence that result from this. And this model, of course, can be further elaborated into a fully temporalized, dynamical model that represents the complex generative processes.

Let us raise with Wan the following question and Wan’s answer to it: Is Bunge’s emergentist systemism any different from the “complex methodological individualism” or “structural individualism” defended by analytical sociologists?

According to Wan there is an important difference between them. The most crucial point is that Bunge’s emergentist systemism admits the ontological status and explanatory role of macro-social entities (as concrete systems) and mechanisms, and therefore it does not stipulate that every causal explanation

of social facts has to include explicit references to individual-level actors and mechanisms. Of course, only actors are capable of “connecting” and “transforming”, or that it is actors and not variables who do the acting, but it does not follow from this that the only units of analysis that can claim to have causal power and significance are situated at the level of individuals and their actions, or that the explanatory strategy based on generative mechanisms has no choice but to take social actors who are generally *individuals* as the sociological atom. As Bunge (1999) himself acknowledges, since “any number of intermediate levels may ... be interpolated,” entities at the micro-level can be “persons and social subsystems.” Corporations, political parties, social movement organizations, as well as their decisions and interactions, for example, are often all one has to refer to at the lower tier of the Boudon-Coleman diagram. Sometimes it is necessary or fruitful to construct a three-tier diagram to take individual-level actors into account, but this depends on the nature of one’s research question. Bunge (2006) usefully points out that highly complex systems “have various concurrent mechanisms,” which means that these systems “undergo several more or less intertwined processes at the same time and *on different levels*”. This coexistence of parallel mechanisms implies that whether the individual level mechanism is the most essential for a given complex social system is an empirical question.

According to Bunge (2003) “In practice we use the notions composition, environment, structure, and mechanism *at a given level* ... Except in particle physics, we never handle the ultimate components of anything ... [W]hen forming a model of a social system (or group) we usually take it to be composed of whole persons; consequently, we limit the internal structure of the system to interpersonal relations. However, *nothing prevents us from constructing a whole sheaf of models of the same society*... We do so when we take certain subsystems of the given social system – for instance, families or formal organizations – to be our units of analysis”.

In sum, while attaching no less importance to micro-foundations, systemism does not involve a dogmatic insistence on making reference to the individual level as a *condition* for social scientific explanations but suggests to go deep into a “multi-scaled social reality”. This is why Wan sides with Bunge’s (emergentist) systemism rather than any type of methodological individualism, however “complex” or sophisticated it claims to be. Therefore, we conclude

this chapter with a brief exposition of the general methodological implications of Bunge's *systemism* and its relevance to the study of social systems.

3- Systemism as an Approach to the Study of Social Systems

Based on scientific and philosophical ontology expounded in chapter one, "Systemism" is the approach adopted by anyone who endeavors to explain the formation, maintenance, repair, or dismantling of a concrete complex thing of any kind. Notice the use of the expression "*approach...*" not "systems theory". There are nearly as many systems theories as systems theorists. Systemism invites us to analyze wholes into their constituents, and consequently it rejects the epistemology inherent in holism.

3.1- Systemism as a General Approach to the Study of Systems

In chapter one on ontological rationale, we have established the centrality of the *part-whole* relation and *level structure* of the world in constructing an ontologically grounded theory of systems, and now it is time to introduce and discuss the *CESM* model laid down by Bunge.

An ontologically solid foundation of a systemic approach needs consideration of:

- (a) what it consists of (*its composition*);
- (b) the environment in which it is located (*its environment*);
- (c) how its components and environmental items are related to one another (*its endostructure* and *exostructure*); and
- (d) how it works, or what makes it what it is (*its mechanisms*).

Therefore, a system s is to be defined by the collection:

$\mu(s) = \langle C(s), E(s), S(s), M(s) \rangle$, where;

1. $C(s)$ = Composition - Collection of all the parts of s ;
2. $E(s)$ = Environment - Collection of items, other than those in s , that act on

or are acted upon by some or all components of s ;

3. $S(s)$ = Structure - Collection of relations, in particular bonds, among components of s (endostructure), or among these and things in its environment (exostructure);
4. $M(s)$ = Mechanism - collection of processes that allow (s) to perform its specific functions.

Remember:

The distinction of a system S from its model(s) $\mu(s)$, just as the electrician distinguishes an electric circuit from its diagram(s). In Bunge's materialist ontology, only concrete (material) systems have mechanisms. Conceptual systems, e.g., theories, and semiotic systems (words, musical notes, figures, and graphs) have compositions, environments, structures, but no mechanisms.

All four components of the model $\mu(s)$ are taken on a given level, such as the person, the household, or the firm in the case of social systems. They are also taken at a given time. In particular, $M(s)$ is a snapshot of those processes in the system in question that are peculiar to its kind, such as research in a scientific team, and combat in a military unit. In turn, a process is a sequence of states; if preferred, it is a string of events. And whereas the net effect of some processes is to alter the overall state of the system, that of others is to maintain such state. For instance, wind moves a sailboat, whereas the impacts of myriad water molecules on the hulk keep it afloat.

Why is the notion of *mechanism* of central importance? The answer is that it is the key to the workings of a system: once the original mechanism is undermined or undergoes changes, the (kind of) system that it makes possible will probably break down or transform. This is why a *deep mechanistic* explanation has to include the notion of mechanism. By contrast, the *covering-law* explanation and *functional* explanation are both *shallow* explanations - mere *descriptions*.

Note the following about mechanistic explanation:

1. Since there may be a number of mechanisms operating and interacting in one and the same system, it is recommended that *essential* mechanisms be dis-

tinguished from *non-essential* mechanisms. While the former are specific to a given kind of system, the latter may also occur in different kinds of systems. For example, organized teaching and research is an essential mechanism of a university but inessential to a firm. An *essential mechanism* of a system is its peculiar functioning or activity. In other words, an essential mechanism is the specific function of a system — that is, the process that only it and its kind can undergo.

The above conflation of ‘mechanism’ with ‘specific function’ is not advisable when one and the same task can be performed by different mechanisms — the cases of functional equivalence. For example, some birds can advance by walking, swimming, or flying; documents can be reproduced by printing presses, mimeographs, or photocopiers; markets can be conquered by force, dumping, free-trade agreements, or even honest competition. Because the functions-mechanisms relation is one-to-many, we should keep the two concepts distinct while relating them. Another reason is that a purely functional account, such as “cars are means of transportation,” though accurate, is superficial because it does not tell us anything about the mechanism whereby the function in question is carried out.

It is important to note that there are no *universal mechanisms*. All mechanisms are stuff-dependent and system-specific. For instance, only live brains, when properly trained and primed, can engage in original research; and only brains in certain abnormal states can hallucinate. Still, mechanisms, like anything else, can be grouped into natural kinds, such as those of cooperation and competition, stimulation and inhibition, blocking and facilitating...etc.

2. Mechanisms are typically unobservable or concealed, so they have to be *conjectured*, not by wild speculations, but with imagination constrained and stimulated by data, well-established hypotheses and mathematical concepts.

3. There is no unique method or logic for conjecturing mechanisms. It is more an art than a rule-directed technique.

4. Since most mechanisms cannot be observed directly, their description necessarily contains concepts that are absent from empirical data, and this is why mathematical thinking, which comprehends the complexity of the world better, is conducive to identifying mechanisms.

5. The *black box* approach (phenomenological, descriptivist, holistic approach) describes the working of the system in question only in terms of its input and output, thus failing to uncover its *components, environment, structure(s)*, and especially its *mechanisms*.

6. How are the concepts of *mechanism* and *law-statement* related? Mechanisms without conceivable laws are called *miracles*. Scientific research presupposes:

(a) *materialism*, or the hypothesis that the real world is material, so that it contains no autonomous (subject-free) ideas; and

(b) the principle of *lawfulness*, according to which all events satisfy some law(s).

Trust in the first principle allows scientists to dispense with the ghostly. And trust in the second principle sustains their search for laws and the rejection of miracles.

However, in the social sciences, law and mechanism are necessary but insufficient to explain, because almost everything social is made rather than found. Indeed, social facts are not only law-abiding but also norm-abiding; and social norms, though consistent with the laws of nature, are not reducible to these, if only because norms are invented in the light of valuations – besides which every norm is tempered by a counter norm.

All real mechanisms are lawful, but the laws-mechanisms relation is one-to-many rather than one-to-one. For example, pollen particles, drunkards, and financial markets move similarly (random walk); the exponential function, another ubiquitous pattern, describes both the growth of a population with unlimited resources and that of scientific papers. Because the *patterns-mechanisms relation is one-to-many*, the search for either can be uncoupled from the search for the other. However, barring miracles, there are no lawless mechanisms any more than there are mechanism-less patterns. Hence, any mechanism-free account must be taken to be shallow and therefore a challenge to uncover unknown mechanism(s). By the same token, any mechanism unsupported by some law(s) must be regarded as ad hoc and therefore equally temporary.

The mechanism-based explanation has received growing attention in recent years. Scientists from both natural and social sciences, including biology, psychology, cognitive neuroscience, physics, sociology, economics and political science, have engaged in the debates over the status of mechanism-based explanation and modeling, even though most of them refer to the explanation based on mechanisms as “mechanistic” explanation instead of what Bunge calls *mechanismic explanation*.

3.2- Systemism and Social systems

For Bunge:

1. A social system is a concrete system composed of gregarious animals that:
 - (a) share an environment;
 - (b) act upon other members of the system; and
 - (c) cooperate in some respects and compete in others.
2. A *human social system* is a social system composed of human beings and their artifacts, held together by feelings, beliefs, moral and legal norms, and mutually related actions.
3. A human social system can be:
 - (a) *natural* (spontaneous) if it emerges by way of free association or reproduction, e.g., families, circle of friends, street-corner gangs;
 - (b) *formal* (designed) if it is formed in compliance with explicit rules or plans, e.g., schools, armies, business firms, political parties, NGOs.
4. A human society is a social system composed of four major subsystems:
 - (a) *biological system*, whose members are bound together by sexual, kinship, and friendship relations;
 - (b) *economic system*, the bonds of which are relations of production and exchange;

(c) *political system*, characterized by the coordination and management of social activities and the struggle for power; and

(d) *cultural system*, the members of which engage in cultural or moral activities like learning, teaching, inventing, designing, singing, painting, and so on.

These four subsystems partially overlap and interact with one another, because most people are members of at least two of them. Bunge calls this systemic view of human society the *BEPC (biological, economic, political, cultural) model*, which he contrasts with the traditional base/superstructure model of Marxism. According to the BEPC model, every social fact has five interrelated aspects: *environmental, bios-psychological, economic, political and cultural*.

Equally important is that every subsystem of society evolves according to its own dynamics as well as under the influence of the other subsystems. Sometimes one of the subsystems takes the lead and the others follow, but at other times it is the turn of a different subsystem to start a new development. There is no single prime social mover, not even in the last analysis.

5. A *super-society* is a system composed of two or more human societies, such as the European Union.
6. The *world system* is the super-society composed of all human societies.
7. A *social process* (or activity) is a process that involves at least two interacting persons and occurs in a social system of all sizes, like *getting married, rearing children, making friends, working, trading and waging war*.
8. A *social movement* is a directed social process that takes place in at least one social system and incorporates people into it.

The above implies the following theorems and postulates for a systemic sociology:

1. Every human being belongs to at least one social system.
2. Social systems are held together by various types of links: *biological* (includ-

ing psychological), *economic, political, or cultural*. *Social segregation* of any of these kinds weakens social cohesion.

- 3 The *beliefs, desires, intentions, preferences, choices, and actions* of every individual are *socially conditioned* by his or her membership in social systems: there are neither *fully autonomous* nor *totally heteronomous* persons.
4. The changes of a social system arise from:
 - (a) endogenous changes in its members,
 - (b) interactions among its members, or
 - (c) interactions among these members and items in the environment.
5. Every social system can be analyzed into its *composition, environment, endo- and exostructure* and *mechanism(s)* (recall the CESM model).
6. From 2 and 5 readily follows that the study of any social system involves investigations into: (a) its *CESM*, and
 - (b) its *BEPC* subsystems.

Researchers should investigate the following:

- (a) how persons or groups interact;
- (b)** how these interactions over time form relatively enduring social relations and social systems, which we take as social facts;
- (c) how these social relations and systems provide contexts that constrain and enable the actions of individuals or groups while affecting their intentions, desires and beliefs, or to put it differently, how individuals or groups alter their thoughts and actions for being part of a social system;
- (d) how social systems interact and act upon each other;
- (e) how individuals or groups influence (thwart, facilitate or transform) the workings of specific social systems, which in turn affect their members;

and

- (f) how changes at the systemic level influence the individuals, who in turn act in ways that reproduce or alter the workings of systems.

Let us take the nuclear family as an example of a social system. The *components* of the nuclear family are the parents and the children; the *environment* is the physical surroundings, neighborhood, workplace and so on; its *endostructure* consists of biological and physiological bonds such as love and sharing, while the *exostructure* is made up of the relations of its members with people in other social systems; lastly, its *mechanisms* consist of daily chores, parent-child interactions, and the like.

In conclusion to this chapter, I concur with Wan that Bunge's systemism is the most mature and appropriate approach to the study of systems and I will adopt it, with due reservations, to develop the Islamic perspective on integration of knowledge in the following three last chapters of this book.

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Chapter 4

Towards an Inclusive, Integrative and Systemic **QUR'ANIC WORLDVIEW**

1- Defining the Concept of a Worldview

“Worldviews are inescapable, overarching systems of meaning and meaning-making that to a substantial extent inform how humans interpret, enact, and co-create reality. Worldviews are thus a complex constellation of ontological presuppositions, epistemic capacities, and ethical and aesthetic values that converge to dynamically organize a synthetic apprehension of the exterior world and one’s interior experience” (Hedlund-de Witt- 2013).

Fig. 1: gives a comprehensive detail of the components of a worldview⁷.

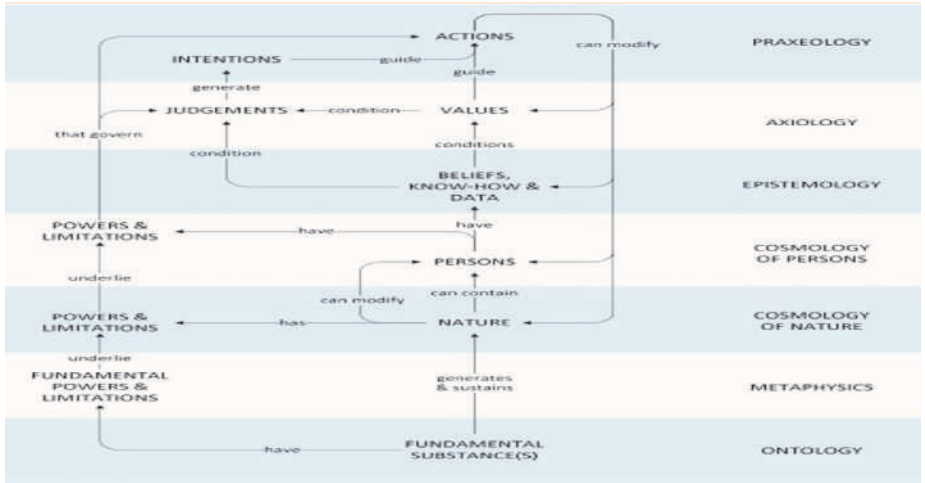
Worldview Component	Key Question	Content Scope	Relevant Concepts	Examples of Worldview Commitments
Ontology	What kinds of substances exist most fundamentally? What grounds the existence of reality?	Theory about what exists most fundamentally; Models of identifying characteristics	Space, time, matter, minds, God, Akasha, Apeiron, consciousness	All concrete things are physical particles or composites of them
Metaphysics	What is the nature of the fundamental existents?	Theory about the powers, limitations and dynamics of what exists (and hence what is possible given the ontology)	Energy, lawfulness, real/imaginary, concrete/abstract, natural/supernatural	An objective reality exists; All changes have lawful causes
Cosmology I (Cosmology of Nature)	What is the nature, origin, developmental history and potential of the natural world?	High-level theory about the origin, history, current state & activity, future and destiny of nature	Big bang, creation, evolution, systems hierarchy, expansion, heat death, transcendence	The world arose at the Big Bang and evolves in accordance with naturalistic laws.
Cosmology II (Cosmology of Persons)	What is the nature, origin, developmental history and potential of human beings?	High-level theory about the origin, history, current state & activity, future and destiny of human beings	Evolution, reproduction, development, sentience, memory, will, agency, freedom, rationality, cognition, judgement, intentionality, wisdom	Human beings are animals with sentience, free will, agency, rationality, rights and duties
Axiology	What is important and why? What makes something ‘good’?	Theories about what is good or important and why	Values, ethics, morality, aesthetics, social construction, utility theory, natural law theory, divine command theory	All sentient beings have the right to life and freedom
Praxeology	How should we live? What gives action meaning? What are our purposes and how can we achieve them?	Theories about what is meaningful or purposeful action and why. Action principles and theories about agency, freedom and responsibility	Free will, choice, agency, freedom, responsibility, duty, best practice	We are responsible for our choices and our actions
Epistemology	What/how can we (not) know?	Theories about what kinds of knowledge are possible and how to gain knowledge	Science, sacred texts, cultural authority, intuition, mystical revelation, experience	The scientific method can progressively reveal the truth about all real phenomena

Source: Rousseau, Billingham: A systemic framework for exploring worldviews

7 - Rousseau, Billingham: A systemic framework for exploring worldviews (2018).

Fig. 2 depicts a worldview as a conceptual system, given the following definitions of a system: “A physical system is a structured set of parts or elements, which together exhibit behavior that the individual parts do not” and “A conceptual system is a structured set of parts or elements, which together exhibit meaning that the individual parts do not”⁸.

Fig. 2: Systemicity of Worldviews



Source: Rousseau, Billingham: A systemic framework for exploring worldviews

A worldview’s systemicity is evident in the way that the content of the components of a person’s worldview change not only to accommodate new information but to strive toward coherence – that is, to make sense as a whole. This is also true in the case of a paradigm (a worldview shared by a group). However, a worldview is not only a conceptual system but also a “map of reality,” a view on the actual world, which is a system also, and a worldview is a model of the structure and coherence of the concrete world.

In Figure 2, we present a diagram that shows one way of illustrating some of the correspondences between the components of a worldview (right hand side) and the aspects of the world that they represent (left hand side) together

⁸ - Rousseau, Billingham: A systemic framework for exploring worldviews (2018).

with some of their interdependencies (linking arrows). This is not a unique or a comprehensive model of the systemicity of the world, but it is sufficient for telling us something important about how worldviews underpin people's behavior.

Figures 1 and 2 represent the guiding framework for my attempt to develop a Qur'anic integrative and systemic worldview. All the elements of the worldview highlighted above by the two figures can be derived from the theoretical framework which I will develop as an Islamic perspective on the issue of integration of knowledge.

2- Science Beyond the Modern Scientific Worldview (Galileo Report + Manifesto)

1. No human intellectual activity, including science, can escape the fact that it has to make assumptions that cannot be proven using its own methodology (absolute presuppositions).
2. The prevalent underlying assumptions, or world model, of the majority of modern scientists are narrowly naturalist in metaphysics, materialist in ontology and reductionist-empiricist in methodology.
3. This results in the belief that consciousness is nothing but a consequence of complex arrangement of matter, or an emergent phenomenon of brain activity.
4. This belief is neither proven, nor warranted.
5. In fact, there are well documented empirical phenomena that contradict this belief. Among them are:
 - a. Veridical reports of near-death experiences (NDEs) with complex intuitions, perceptions, cognitions, and emotions during well documented absence of brain activity.
 - b. Veridical reports of non-local perception that were confirmed independently during such near-death-states of absent brain activity.

- c. The large database of parapsychology and anomalous cognition research shows in a series of meta-analyses that such non-local perceptions are indeed possible.
 - d. The large database of children who remember previous lives.
6. An increasing number of open-minded scientists are already researching these frontier areas using existing scientific methods and are reaching empirically grounded conclusions that challenge the mainstream majority view.
 7. They, therefore, argue that we need a model of consciousness that is non-reductive and allows consciousness its own ontological status.
 8. A minimum-consensus model is a dual aspect or complementarity model, in which matter and mind, consciousness and its physical substrate, are two aspects of reality that are irreducible and simultaneously occurring perspectives of an underlying reality to which we otherwise have no direct access.
 9. If that is granted, we can immediately see that consciousness can have its own direct access to reality, not only through sense perception, as in classical empiricism, but also through inner perception or radical introspection.
 10. As a result, there may be a different and valid access route to reality, through consciousness, in addition to the classical one science is offering.
 11. This might include direct access, under certain conditions, to deeper structures of reality, which may provide important insights into ethics, meaning, and values.
 12. Indeed, insights from NDEs and other transformative experiences suggest that we are all embedded within a larger field of consciousness, with profound implications for ethics in an interconnected world.
 13. Integrating an enlarged view of consciousness into science will also yield a new methodology that will have to be developed: the methodology of radical introspection or inner experience.

14. In view of the widespread perception that a narrow materialist worldview is often uncritically passed on to young scientists by mainstream authorities as an adequate explanation of reality and as a pre-condition for a successful scientific career, we call for an open exploration of this topic and we encourage the scientific community to become more critically self-reflective of the absolute presuppositions on which their activities are based and to consider expanding their scope.
15. According to the post-materialist paradigm:
 - a. Mind represents an aspect of reality as primordial as the physical world. Mind is fundamental in the universe, i.e., it cannot be derived from matter and reduced to anything more basic.
 - b. There is a deep interconnectedness between mind and the physical world.
 - c. Mind can influence the state of the physical world and operate in a nonlocal (or extended) fashion. Since the mind may nonlocally influence the physical world, the intentions, emotions, and desires of an experimenter may not be completely isolated from experimental outcomes, even in controlled and blinded experimental designs.
 - d. Minds are apparently unbounded, and may unite in ways suggesting a unitary, One Mind that includes all individual, single minds.
 - e. NDEs in cardiac arrest suggest that the brain acts as a transceiver of mental activity, i.e., the mind can work through the brain, but is not produced by it. NDEs occurring in cardiac arrest, coupled with evidence from research mediums, further suggest the survival of consciousness, following bodily death, and the existence of other levels of reality that are non-physical.
 - f. Scientists should not be afraid to investigate spirituality and spiritual experiences since they represent a central aspect of human existence.
16. Post-materialist science does not reject the empirical observations and great value of scientific achievements realized up until now. It seeks to

expand the human capacity to better understand the wonders of nature, and in the process rediscover the importance of mind and spirit as being part of the core fabric of the universe. Post-materialism is inclusive of matter, which is seen as a basic constituent of the universe.

17. The shift from materialist science to post-materialist science may be of vital importance to the evolution of the human civilization.

3- A Qur`anic Worldview (QWV) For A Post-materialist Science

3.1- The Composition of the Religion of Islam (The Five Universals)

Islam is composed of five interactive entities which may be termed the five universals. We call them universals because they are the necessary and sufficient condition for any viable Islamic representation of individual and social existence. They can be derived chronologically from the following verses⁹:

﴿هُوَ الَّذِي بَعَثَ فِي الْأُمِّيِّينَ رَسُولًا مِّنْهُمْ يَتْلُو عَلَيْهِمْ آيَاتِهِ - وَيُزَكِّيهِمْ وَيُعَلِّمُهُمُ الْكِتَابَ وَالْحِكْمَةَ وَإِنْ كَانُوا مِن قَبْلُ لَفِي ضَلَالٍ مُّبِينٍ ٢﴾ (الجمعة)

«It is He who has sent among the unlettered a Messenger from themselves reciting to them His verses and purifying them and teaching them the Book and wisdom - although they were before in clear error (2) » (al-Jumu'ah),

﴿لَقَدْ مَنَّ اللَّهُ عَلَى الْمُؤْمِنِينَ إِذْ بَعَثَ فِيهِمْ رَسُولًا مِّنْ أَنفُسِهِمْ يَتْلُوا عَلَيْهِمْ آيَاتِهِ - وَيُزَكِّيهِمْ وَيُعَلِّمُهُمُ الْكِتَابَ وَالْحِكْمَةَ وَإِنْ كَانُوا مِن قَبْلُ لَفِي ضَلَالٍ مُّبِينٍ ١٦٤﴾ (آل عمران)

(Certainly, did Allah confer [great] favor upon the believers when He sent among them a Messenger from themselves, reciting to them His verses and purifying them and teaching them the Book and wisdom, although they had been before in manifest error) (Al-Imran 164).

9 - A more robust approach to derive these universals from the holy Qur`an and examine their interactions can be found in various Arabic and English papers published by the author the earliest of which is (Biraima. A Qur`anic Model for a Universal Economic Theory. King Abd-Alaziz University Journals: Islamic Economics- 1993).

The verses state that the divine message to be delivered by the Prophet, *peace be upon him*, to humans is composed of four fundamental components: *“reciting to them His verses”*; *“purifying them”*; *“teaching them the Book”*; *“teaching them wisdom”*. I will follow the following steps of abstraction to derive the five universals:

1. The stock of revealed knowledge (علم) about Allah (SWT) and about His creation. This is the first component of the first universal (Knowledge) abstracted from *“reciting to them His verses”*,
2. *“Iman”* and the ensuing purification of the self, which is the second universal abstracted from *“purifying them”*,
3. The stock of pronounced prophetic knowledge (السنة القولية) about life on earth. This is the second component of the universal (Knowledge) abstracted from *“teaching them the Book”*,
4. The stock of practical prophetic knowledge about how to act in real-life situations (good deeds) (السنة العملية). This is the third component of the universal (Knowledge) abstracted from *“teaching them wisdom”*.

From these four steps we managed to derive two of the five universals, namely the stock of Knowledge (K) and Iman (I), with the first component of (K) coming first followed by (I) in the chronological order of the universals as stated in the above verses. This ordering reflects the direction of causal relations rather than ranking these universals in terms of absolute importance. Knowledge about Allah (SWT) as evidenced from knowledge about His creation is a primary cause for belief in Him to take place in the heart of the believer. However, belief in Allah (SWT) – Iman - has to be manifest in real earthly life which necessitates the emergence of the other components of prophetic revealed knowledge. However, in the order of importance of preservation, Iman has absolute priority over all the other four universals. (I) is the intended output to be generated by the interaction of the other universals as will be shown in the coming few pages.

Now, we move on in our theoretical abstraction to derive the other three universals implied by the above verses. The two components of prophetic knowledge that follow after Iman are about the implications of this Iman for life on earth, mainly how to transform human actions into *“good deeds”*. Thus, we ask the following necessary question: What is the essence of life on

earth as seen from the perspective of revelation and what are the fundamental domains of this life that ground good deeds? The following verses provide us with the answer as to the nature of life on earth as designed by Allah (SWT) for the worldly life of humans:

﴿إِنَّا جَعَلْنَا مَا عَلَى الْأَرْضِ زِينَةً لِّهَا لِنَبْلُوهُمْ أَيُّهُمْ أَحْسَنُ عَمَلًا﴾ (الكهف ٧)

(Indeed, We have made that which is on the earth adornment for it that We may test them [as to] which of them is best in deed -Al Kahf, 7).

What is it on the earth that Allah (SWT) made it “adornment” to test man for good deeds?

﴿الْأَمْوَالُ وَالْبَنُونَ زِينَةُ الْحَيَاةِ الدُّنْيَا وَالْبَاقِيَاتُ الصَّالِحَاتُ خَيْرٌ عِنْدَ رَبِّكَ ثَوَابًا وَخَيْرٌ أَمَلًا﴾ (الكهف) ٤٦

(Wealth and children are [but] adornment of the worldly life. But the enduring good deeds are better to your Lord for reward and better for [one>s] hope – Al Kahf: 46).

Thus “Wealth” and “Children” are the fundamental entities with which earth is endowed, both for the sustenance of human life and as an allurement to test mankind for good deeds. Thus Wealth (W) and Children (C) are two of the five universals of Islam in addition to Knowledge (K) and Iman (I). The fifth universal is obviously the human Self (S) to which the message of revelation is addressed.

From the above deductive steps, we derive the Five Universals of Islam, with the Self (S) mediating the consciousness domain (K, I) and the action domain (W, C):

1. “Knowledge” (K)
2. “Iman” (I)
3. “Self” (S)
4. “Wealth” (W)
5. “Children” (C)

3.2- The Systemic Relationship Between the Five Universals of Islam

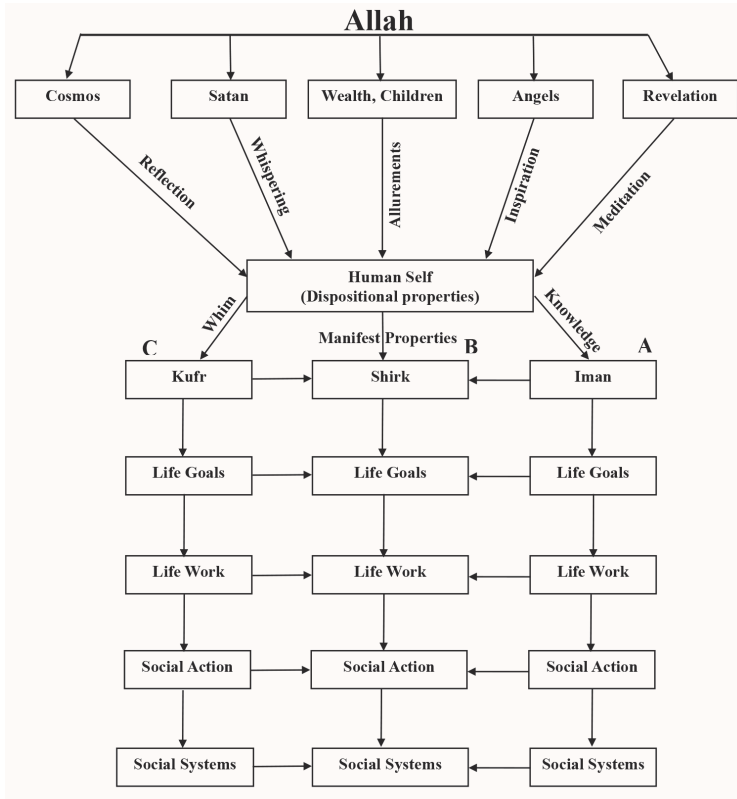
The five universals (K, I, S, W, C) are not independent of each other, but causally related, with "Iman" as the primary intended goal to be preserved - generate, maintain and increase - by dynamically controlling the systemic interaction of the other four entities. These five entities have a systemic interactive relationship that results in the emergence of the Islamic (*Tawhidi*) social system as an empirical reality (إقامة الدين). These systemic social interactions will be discussed in detail in the next chapter where we attempt to develop an Islamic perspective on social systems based on the Qur`anic worldview. This systemic relationship is also the core of the Tawhidi Worldview, which is a conceptual subsystem of the Qur`anic Worldview as we will see below.

4- A Qur`anic Worldview for a Post-materialist Science

Fig. 3 depicts a flow chart of the Qur`anic worldview (QWV), theoretically derived elsewhere by the author from the holy Qur`an under the name: *The Master plan of Creation*¹⁰. The flow chart shows the primordial causal relations between the various entities that make up the QWV. However, Fig. 4 depicts a schematic diagram that shows the various levels of reality that constitute the QWV as can be abstracted from the holy Qur`an and the embeddedness of social reality in such levels. The diagram in Fig. 4 brings in more details than can be shown in the flow chart and these details will be valuable in our analysis of the Qur`anic explanation of social reality in the next chapter when we develop a preliminary general theory of human social systems derived from the QWV.

10- Biraima. A Qur`anic Model for a Universal Economic Theory. King Abd-Alaziz University Journals: Islamic Economics (1993).

Fig. 3: Qur`anic worldview (QWV)



Notice the following from a bird's eye view of Fig. 3:

Firstly, the decisive role of the *Five Universals of Islam* (K, I, S, W, C) and their interactions (*Tawhidi social system*) in the determination of the (QWV);

Secondly, the central role of the human "Self", with its dispositional properties of "transgression" and "piety" in dividing the QWV into two sub-worldviews, the *Tawhidi* Worldview (column A) and the *Secular* Worldview (column B);

Thirdly, the fundamental role of the universal "Knowledge" in the differentiation between the *Tawhidi* and the *Secular* worldview. The first is *Iman-based* and *knowledge-driven*, the second is *worldly pleasures-based* and *whims-driven*;

Fourthly, the decisive role of “*Integration*” of knowledge in QWV. This can be seen from the convergence of multi-sources of knowledge {Allah (Angels, Qur`an, Cosmos, Earthly Realities)}, through their causal powers, on the “Self” and the emergence of *Tawhidi knowledge* as a cognitive output resulting from ontological and epistemological integration of knowledge derived from these sources.

The entities depicted in Fig. 3 as converging on the *self* from above constitute part of the environment within which the human self is embedded - Fig. 4 - and through their causal powers, they exert external influences on it. This causal influence generates multiple effects on the human self, other than *Tawhidi knowledge*, in the *cognitive, emotional, volitional* and *praxis* domains. The ultimate outcomes of these various effects, given the metaphysics of the self, are the diverse social phenomena summarized by the flow chart in Fig. 3. They will make the foundation of our theoretical endeavor in the next chapter to develop a general theory of social systems derived from QWV and grounded on the ontological, epistemological and methodological systems frameworks developed in the previous chapters of this book.

Figures 5, 6 and 7 below depict the emergent social subsystems of QWV. These models of social systems which reflect the Qur`anic perspective on social reality will be used extensively in the next chapter as an example of integration of knowledge in a specialized area of knowledge, namely, social reality.

Fig. 4: Ontology of the Qur'anic Worldview

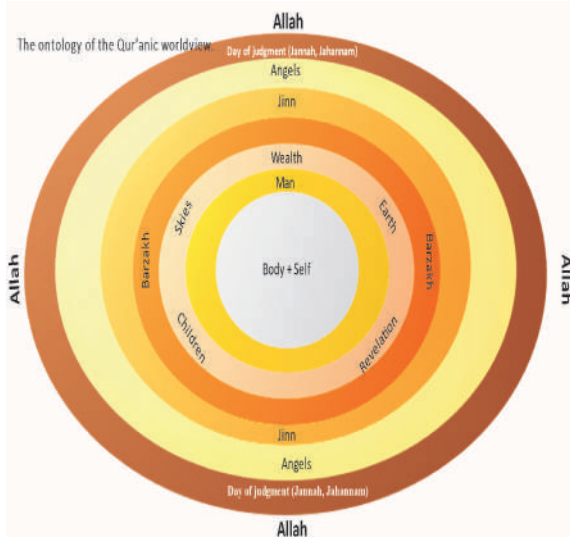


Fig. 5: Tawhidi Social System

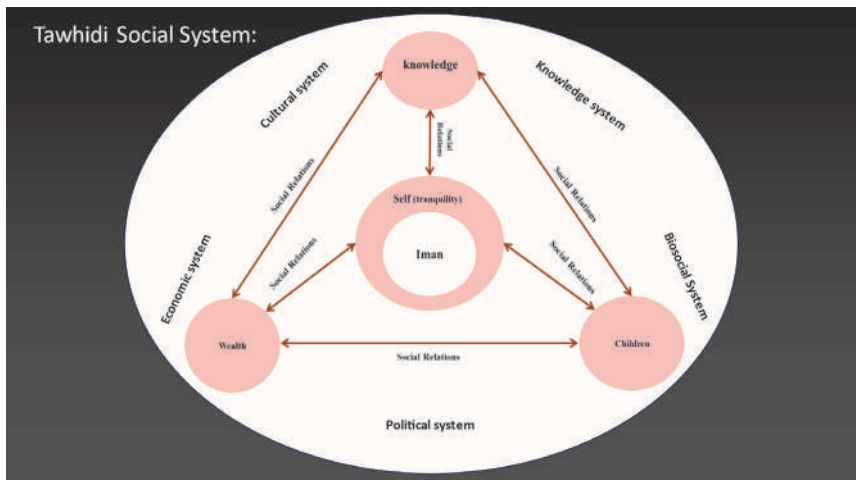


Fig. 6: Secular Social System

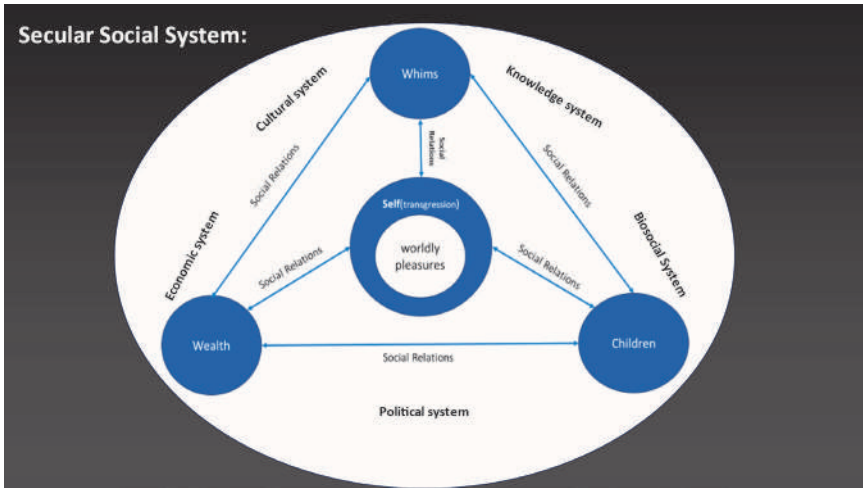
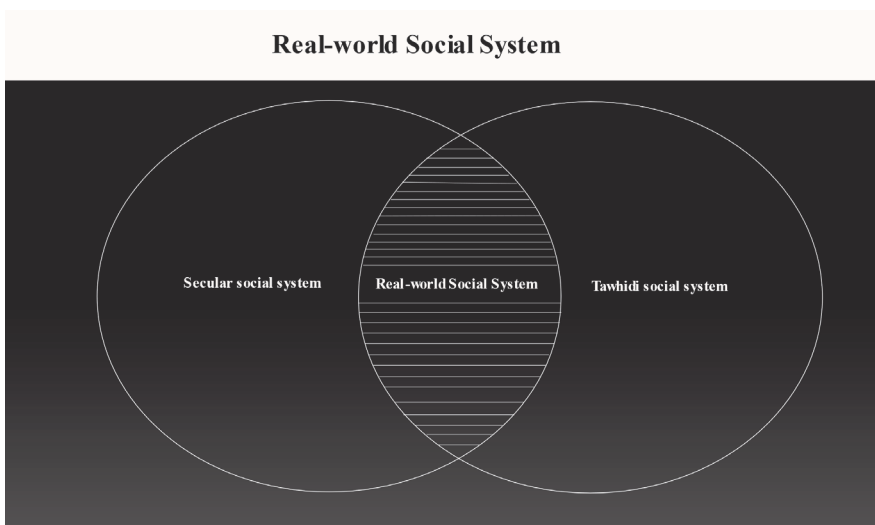


Fig. 7: Real-world Social System



The QWV, summarized in Fig. 4, implies the following fundamental ontological categories of existence:

Creator - Allah (SWT):

- **Revelation,**
- **Creation:**

A - Invisible world:

- 1 - Paradise,
- 2 - Hell,
- 3 - Angels,
- 4 - Jinn,
- 5- Barzakh Spirits,

B - Visible world:

- 1 - Skies,
- 2 - Earth,
- 3 - Human beings,
- 4 - Other biological entities

The ontological categories of the QWV listed above imply the following kinds of knowledge:

- 1 - Knowledge about Knowledge,
- 2 - Knowledge about Allah (SWT),
- 3 - Knowledge about Revelation,
- 4 - Knowledge about the Hereafter,
- 5 - Knowledge about Paradise,
- 6 - Knowledge about Hell,
- 7 - Knowledge about Angels,
- 8 - Knowledge about Jinn,

- 9 - Knowledge about Intervening stage (Barzakh),
- 10 - Knowledge about Cosmos,
- 11 - Knowledge about Earth,
- 12 - Knowledge about Living Creatures,
- 13 - Knowledge about Man,
- 14 - Knowledge about Wealth,
- 15 - Knowledge about Society,
- 16 - Knowledge about the interdependence between all these levels of reality,

The acquisition of all these kinds of knowledge is necessary for Muslims because it is implied by the systemic ontology of QWV. Knowledge should be useful knowledge, i.e., generates, sustains, and increases Iman in the heart and “good deeds” on earth. This usefulness defines the goals of the scientific enterprise within the *Tawhidi* worldview.

5- The QWV As a Worldview of Complex Systems

5.1 - Complex Systems

A system is a complex object every part or component of which is connected with other parts of the same object in such a manner that the whole possesses some features that its components lack - that is, emergent properties. A system may be conceptual or concrete but not both. A conceptual system is a system composed of concepts linked together by logical or mathematical relations. Classifications and theories are conceptual systems. A concrete, or material, system is one composed of concrete things linked together by nonconceptual ties, such as physical, chemical, biological, economic, political, or cultural links. Concrete systems that stand for or represent other objects, such as languages, texts, and diagrams, may be called symbolic or semiotic.

5.2 - Ontology

Ontology as a branch of philosophy is the science of what is, of the kinds and structures of objects, properties, events, processes, and relations in every area of reality. “Ontology” is often used by philosophers as a synonym of

“metaphysics” (what comes after the Physics). Sometimes “Ontology” is used in a broader sense, to refer to the study of what might exist; “metaphysics” is then used for the study of which of the various alternative possible ontologies is in fact true of reality.

5.3 - Epistemology and Methodology

Epistemology, or the theory of knowledge is the field of research concerned with human knowledge in general - ordinary and scientific, intuitive, and formal, pure and action-oriented. And methodology - not to be mistaken for methodic, or a set of methods or techniques- is the discipline that studies the principles of successful inquiry, whether in ordinary life, science, technology, or the humanities.

5.4 - Paradigm

In his book “The Structure of Scientific Revolutions”, Kuhn defines a scientific paradigm as: “universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of practitioners, i.e. what is to be observed and scrutinized, the kind of questions that are supposed to be asked and probed for answers in relation to this subject, how these questions are to be structured, what predictions are made by the primary theory within the discipline, how the results of scientific investigations should be interpreted, how an experiment is to be conducted, and what equipment is available to conduct the experiment”.

6 - Systemism as an Approach to the Study of Systems

6.1 - Definition

A systemic mindset stems from “Systemism”, the worldview that the universe consists of systems, in its integrity and its parts, from the atomic scale to the astronomical scale, from unicellular organisms to the most complex species, humans included, and from the physical world of perceptible matter to the conceptual realm of our human mind. “Systemism” offers us the best framework to systematize and infuse order in our everlasting quest to make sense of the world around us and develop and deploy our knowledge about this world in meaningful and productive ways. It also helps us optimize our engagement with others and bring about processes and products that none of us can produce on her/his own independently from others.

6.2 - System schema

We define a system of any sort, in both the physical world and the conceptual realm of human knowledge, in accordance with a four-dimensional schema that specifies the system's *scope*, *constitution*, and *performance* in the context of an appropriate *paradigm*.

6.2.1 - The scope of the system

a. system "domain", or the field or area in which it exists and is of importance;

b. system "function", or the specific purposes it is meant to serve in that domain;

6.2.2 - The constitution of the system

a. system "composition", i.e., its primary constituents that may be physical or conceptual entities inside the system, and that are relevant to its function, as opposed to secondary entities that may actually be part of the system but that may be ignored because we deem them irrelevant to the system function;

b. system "structure", i.e., primary connections (interactions or relationships) among primary constituents that determine how the system serves its function;

c. system "environment", i.e., its primary agents or primary physical or conceptual entities outside the system, other systems included, along with their primary individual properties, that may significantly affect the system structure and function, and that may be separated into two clusters, local in the immediate vicinity, and global in relatively distant or remote areas;

d. system "ecology", i.e., primary connections (interactions or relationships) between individual primary agents and constituents, and/or between the system as a whole and its environment, that significantly affect how the system serves its function and affects the environment.

6.2.3 - The performance of the system

a. the system "processes", i.e., dynamical actions (operations, mechanisms) which constituents, and/or the system as a whole, might be engaged in, on their own (closed system) and/or under external influence of the environment

(open system), in order to serve the function of the system following specific rules of engagement;

b. system "output", i.e., products, events, or any other effect that the system actually brings about, on its own or in concert with other systems, as a consequence of its ecological interactions and processes, and that may fall within or beyond the scope originally set for the system.

7 - Examples of Systems in the Qur`anic World View

7.1. Man as a Complex Living System of Subsystems:

7.1.1 - The human "soul" as a system of divine qualities designed for man (authentic Hadith of the creation of mercy in 100 parts);

7.1.2 - The human "body" as a material system designed for man;

7.1.3 - The human "self" as an emergent dual system of the combination of the two systems of body and soul;

7.1.4 - Man in his "integrity" and wholeness as an emergent system from the interaction between his components (self, body) and his environment (wealth, children, earth, revelation, skies, Jinn, Angels, Paradise, Hell) and Allah (SWT).

7.2. The Holy Qur`an As a Complex Conceptual System of Apodictic Knowledge

﴿الرَّ كُتُبٌ أُحْكِمَتْ ءَايَتُهُ ثُمَّ فُصِّلَتْ مِن لَّدُنِّ حَكِيمٍ خَبِيرٍ ۝١﴾ (هود)

(Alif, Lam, Ra. [This is] a Book whose verses are perfected and then presented in detail from [one who is] Wise and Acquainted (1) » [Hud: 1]

﴿أَفَلَا يَتَذَكَّرُونَ الْفُرْعَانَ وَلَوْ كَانَ مِن عِنْدِ غَيْرِ اللَّهِ لَوَجَدُوا فِيهِ آخِثَاتًا كَثِيرًا ۝٨٢﴾ (النساء)

(Then do they not reflect upon the Qur`an? If it had been from [any] other than Allah, they would have found within it much contradiction (82) » [An-Nisaa: 82]

The holy Qur`an, in its textual integrity, is a closed system of apodictic divine knowledge, but in its conceptual dimension it is an open system of meaning, with the following characteristics:

7.2.1 - *System domain*: entire existence (Allah SWT and His evolving creation in the visible and invisible worlds);

7.2.2 - *System function*: providing sustained relevant authoritative knowledge (K) to the human self (S) in its evolutionary course of history in order to generate, sustain and increase Iman (I) in the domain of consciousness and to realize its potentialities in the domain of action (W, C);

7.2.3 - *System composition*: the entire verses of the holy Qur`an,

7.2.4 - *System structure*: logical and semantic bonds;

7.2.5 - *System environment*: humans, Muslims and non-Muslims, the narrative of various scholars, in different disciplines, in dealing with the holy Qur`an, and the Islamic heritage in Shari`ah knowledge;

7.2.6 - *System ecology*: Learning, seeking spiritual guidance, deriving *Ahkam*, attacking Islam...etc.

7.2.7 - *System processes*: conceptual systems have no processes of their own, but rely on the mental and physical processes of humans when interacting with them; e. g., via the mechanism of contemplation “تدبّر”, or that of recitation (تلاوة) the holy Qur`an may cause psychological and physical healing to the believers.

7.2.8 - *System output*: authoritative knowledge in the following domains:

- 1 - Knowledge about Knowledge,
- 2 - Knowledge about Allah (SWT),
- 3 - Knowledge about Revelation,
- 4 - Knowledge about the Hereafter,
- 5 - Knowledge about Paradise,
- 6 - Knowledge about Hell,
- 7 - Knowledge about Angels,
- 8 - Knowledge about Jinn,
- 9 - Knowledge about Intervening stage (Barzakh),

- 10 - Knowledge about Skies,
- 11 - Knowledge about Earth,
- 12 - Knowledge about Living Creatures,
- 13 - Knowledge about Man,
- 14 - Knowledge about Wealth,
- 15 - Knowledge about Society,
- 16 - Knowledge about the interdependence between all these levels of reality,

As a closed textual system, the holy Qur`an influences other systems but is not influenced by them, e.g., printing and production of its text in various paper and electronic forms has economic consequences; establishing “*khalwa*” for memorizing its text by rote has diverse social consequences; expecting good omens from just keeping, or reciting the Qur`an in the house, or in the car has psychological consequences.

We should read the holy Qur`an in a comprehensive manner as a knowledge system through the lens of its systemic worldview. Deriving theories and hypotheses about the world from the holy Qur`an will not affect its authenticity and integrity as a divine source of apodictic knowledge because its preservation is guaranteed by Allah (SWT).

Human knowledge derived from the holy Qur`an is fallible, therefore it must be subjected to both analytic and synthetic tests. Our systemic reading of the holy Qur`an through its systemic worldview should continuously enrich and expand this worldview in all its components, thus enriching and expanding our knowledge of the world. This will further expand and enrich our understanding of the holy Qur`an as a conceptual system of apodictic knowledge, and also expand the human fallible knowledge derived from it.

7.3 - *The Study of Man as an Example of Systemic Integration of Knowledge*

The following verses will furnish the exposition:

﴿وَإِذْ قَالَ رَبُّكَ لِلْمَلَائِكَةِ إِنِّي خَلَقْتُ بَشَرًا مِّن صَلْصَلٍ مِّن حَمَإٍ مَّسْنُونٍ ٢٨ فَإِذَا سَوَّيْتُهُ وَنَفَخْتُ فِيهِ مِن رُّوحِي فَقَعُوا لَهُ سَاجِدِينَ ٢٩﴾

«And [mention, O Muhammad], when your Lord said to the angels, «I will create a human being out of clay from an altered black mud (28) And when I have proportioned him and breathed into him of My [created] soul, then fall down to him in prostration.» (29) » [Al-Hijr]

﴿وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ سُلْطَةٍ مِنْ طِينٍ ۚ ١٢ ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَكِينٍ ۚ ١٣ ثُمَّ خَلَقْنَا النَّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظْمًا فَكَسَوْنَا الْعِظْمَ لَحْمًا ثُمَّ أُنشَأْنَاهُ خَلْقًا ۖ آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ۚ ١٤﴾
(المؤمنون)

«And certainly did We create man from an extract of clay (12) Then We placed him as a sperm-drop in a firm lodging (13) Then We made the sperm-drop into a clinging clot, and We made the clot into a lump [of flesh], and We made [from] the lump, bones, and We covered the bones with flesh; then We developed him into another creation. So blessed is Allah, the best of creators (14) » [Al-Muminun: 12-14]

﴿وَنَفْسٍ وَمَا سَوَّاهَا ۚ ٧ فَأَلْهَمَهَا فُجُورَهَا وَتَقْوَاهَا ۚ ٨ قَدْ أَفْلَحَ مَنْ زَكَّاهَا ۚ ٩ وَقَدْ خَابَ مَنْ دَسَّاهَا ۚ ١٠﴾ (الشمس)

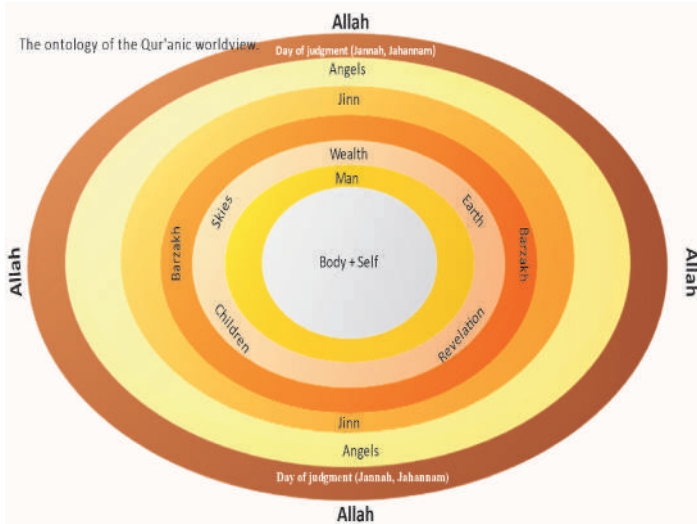
«And [by] the soul and He who proportioned it (7) And inspired it [with discernment of] its wickedness and its righteousness (8) He has succeeded who purifies it (9) And he has failed who instills it [with corruption](10)» [Ash-Shams: 7-10]

Based on the above Qur`anic verses we can recognize the following hierarchy of systems in the composition of man:

- 1 - Physical system
- 2 - Chemical system
- 3 - Biological system
- 4 - Soul system (divine qualities created for man)
- 5 - Psychological system
- 6 - Human being system

These interdependent systems represent different levels of reality connected via bottom-up and top-down mechanisms such that their intense interactions led to the emergence of man. Man in his totality as a human being is not just the making of his systemic components, but also a result of his continuous interaction with systems of his external environment in the visible world

(wealth, children, earth, skies) and with the world of the invisible (Jinn, Angels) and above all with his Creator, Allah (SWT). Many philosophies of science do not believe in the world of the invisible, but postmaterialist science, as mentioned at the beginning of this chapter, does. These interactions between the different subsystems and the consequent emergence of man will be discussed in some detail in the next chapter on social systems. Below we reproduce Fig. 4 to show the embeddedness of man in his visible and invisible environment.



8 - Level Structure of Creation in the Qur'anic Worldview

Let us remind ourselves of the following relevant issues from both *systems ontology* and *postmaterialist science* which we have discussed earlier in this book. According to Bunge in any given system (molecule, organism, family, school, factory, etc.), at least two levels can be discerned: the macro and the micro:

The macro-level is the kind itself, that is, the collection of all the systems sharing certain peculiar properties. The corresponding micro-level is the collection of all the components of the systems in question. There may be more than one micro-level.

It is of crucial importance to recognize that *levels are collections of things, and*

hence are concepts, not concrete things. Therefore, levels cannot act upon one another. In particular, the expression 'micro-macro interaction' ... does not denote an interaction between micro and macro levels but an interaction between entities belonging to a micro-level and things belonging to a macro-level.

An ontological hypothesis involved in and encouraged by modern science is that reality, such as known to us today, is not a solid homogeneous block but is divided into several levels, or sectors, each characterized by a set of properties and laws of its own. A second, related presupposition is that *the higher levels are rooted in the lower ones, both diachronically and synchronically*: that is, the higher levels are not *autonomous* but depend for their existence on the subsistence of the lower levels, and *they have emerged in the course of time from the lower in a number of evolutionary processes*. This rooting of the higher is the objective basis of the possibility of partially explaining the higher in terms of the lower or conversely.

According to the *post-materialist paradigm of science* summarized above we need a model of consciousness that is non-reductive and allows consciousness its own ontological status. A minimum-consensus model is a dual aspect or complementarity model, in which matter and mind, consciousness and its physical substrate, are two aspects of reality that are irreducible and simultaneously occurring perspectives of an underlying reality to which we otherwise have no direct access.

Based on these ontological commitments and given our stated objective of situating the project of *Islamic integration of knowledge (IIOK)* within the worldwide academic project of integration of knowledge (IOK) I would like to outline the main levels of reality implied by the QWV. We make a fundamental distinction between Allah (SWT), the Creator, and His creation. This distinction is forcefully emphasized by the holy Qur'an ad Sunnah. Fig. 4 shows this distinction where Allah SWT is of all things encompassing as the following verse confirms.

﴿أَلَا إِنَّهُمْ فِي مِرْيَةٍ مِّن لِّقَاءِ رَبِّهِمْ أَلَا إِنَّهُ بِكُلِّ شَيْءٍ مُّحِيطٌۖ﴾ (فصلت: 54)

«Unquestionably, they are in doubt about the meeting with their Lord. Unquestionably He is, of all things, encompassing (54) » [Fussilat: 54]

I will use the following verses from the holy Qur`an and an authentic Hadith to derive some important metaphysical propositions, which are also corroborated by the scientific findings of post-modernist science just mentioned.

﴿قَالَ رَبُّنَا الَّذِي أَعْطَى كُلَّ شَيْءٍ خَلْقَهُ ثُمَّ هَدَىٰ. ٥٠﴾ (طه)

«He said, «Our Lord is He who gave each thing its form and then guided [it].»(50)
» (Ta-ha);

﴿سُبْحٰنَ لَهُ السَّمٰوٰتُ السَّبْعُ وَالْاَرْضُ وَمَنْ فِيْهِنَّ وَاِنْ مِنْ شَيْءٍ اِلَّا يُسَبِّحُ بِحَمْدِهِ- وَلٰكِنْ لَا تَفْقَهُوْنَ تَسْبِيْحَهُمْ اِنَّهٗ كَانَ حَلِيْمًا غَفُوْرًا ٤٤﴾
(الإسراء: 44)

« The seven heavens and the earth and whatever is in them exalt Him. And there is not a thing except that it exalts [Allah] by His praise, but you do not understand their [way of] exalting. Indeed, He is ever Forbearing and Forgiving » (Isra: 44).

﴿عن أبي هريرة رضي الله عنه قال: سمعت رسول الله، صلى الله عليه وسلم، يقول: «جَعَلَ اللهُ الرَّحْمَةَ مِائَةَ جُزْءٍ، فَأَمْسَكَ عِنْدَهُ تِسْعَةً وَتِسْعِينَ، وَأَنْزَلَ فِي الْأَرْضِ جُزْءًا وَاحِدًا، فَمِنْ ذَلِكَ الْجُزْءِ يَتَرَاخَمُ الْخَلَائِقُ، حَتَّى تَرْفَعَ الدَّابَّةُ خَافِرَهَا عَنْ وَلَدِهَا خَشْيَةً أَنْ تُصِيبَهُ». وفي رواية «إِنَّ لِلَّهِ تَعَالَى مِنْهُ رَحْمَةً، أَنْزَلَ مِنْهَا رَحْمَةً وَاحِدَةً بَيْنَ الْجِنِّ وَالْإِنْسِ وَالْبَهَائِمِ وَالْهَيَوَانِ، فِيهَا يَتَعَاظِفُونَ، وَبِهَا يَتَرَاخَمُونَ، وَبِهَا تَعْطِفُ الْوَحْشُ عَلَى وَلَدِهَا، وَأَخَّرَ اللَّهُ تَعَالَى تِسْعًا وَتِسْعِينَ رَحْمَةً يَرَحِمُ بِهَا عِبَادَهُ يَوْمَ الْقِيَامَةِ». وعن سلمان الفارسي رضي الله عنه قال: قال رسول الله، صلى الله عليه وسلم: «إِنَّ لِلَّهِ تَعَالَى مِنْهُ رَحْمَةً فَمِنَهَا رَحْمَةٌ يَتَرَاخَمُ بِهَا الْخَلْقُ بَيْنَهُمْ، وَتَسْعُ وَتَسْعُونَ لِيَوْمِ الْقِيَامَةِ». وفي رواية: «إِنَّ اللَّهَ تَعَالَى خَلَقَ يَوْمَ خَلَقَ السَّمَاوَاتِ وَالْأَرْضِ مِنْهُ رَحْمَةً كُلُّ رَحْمَةٍ طَبَاقٍ مَا بَيْنَ السَّمَاءِ إِلَى الْأَرْضِ، فَجَعَلَ مِنْهَا فِي الْأَرْضِ رَحْمَةً فِيهَا تَعْطِفُ الْوَالِدَةُ عَلَى وَلَدِهَا، وَالْوَحْشُ وَالطَّيْرُ بَعْضُهَا عَلَى بَعْضٍ، فَإِذَا كَانَ يَوْمَ الْقِيَامَةِ أَكْمَلَهَا بِهَذِهِ الرَّحْمَةِ». [صحيح] - [حديث أبي هريرة - رضي الله عنه - متفق عليه. حديث سلمان - رضي الله عنه - رواه مسلم] ﴿

Abu Hurayrah (may Allah preserve him) reported that the Prophet (may Allah's peace and blessings be upon him) said: «Allah made mercy into one hundred parts. He retained with Him ninety-nine parts and sent down to earth one part. Because of this one part, creatures show mercy towards each other, so much so that an animal lifts its hoof away from its youngster lest it should hurt it”.

Proposition 1

Everything comes into existence as a necessary outcome of the efficacy of the divine attributes of Allah (SWT) in the context of a Master Plan of Creation (MPC).

Proposition 2

Everything is primarily a dual system with two primary components; a **material** (energy) component that gives it its form and a **soul** component (properties) that gives it its guidance (substance).

Proposition 3

The soul system is a system of divine attributes, e.g., mercy, knowledge, seeing, hearing, power, creativity, justice, will, peace, belief, cordiality, thankfulness, patience, etc., created in proportion to the function for which the thing is created.

Proposition 4

The potential causal powers of the created divine attributes, e.g., mercy, are relative and finite, while as attributes of Allah SWT their causal powers are absolute and infinite.

Proposition 5

The soul system as a system of abstract properties has no efficacy in itself until it is infused into a concrete material thing and becomes a component part of its properties.

Proposition 6

The soul system starts with a few elements of divine properties and increases in complexity in proportion to the increase in the complexity of the material things for which it has been created. The most complex soul system is that created for the human body. Its elements include all the divine properties according to which other things of the world are created. This is because man has been graced by Allah (SWT) and chosen as vicegerent on earth. Adam (AS) has been taught the names (properties) of all the created things because such knowledge is necessary for man to carry his vicegerency.

Proposition 7

The soul system infused in every created material thing has two functions; the first is to make it conscious of Allah (SWT), its Creator; the second is to activate its causal powers that enable it to perform the functions for which

it has been created. The holy Qur`an states unequivocally that every created thing exalts by the praise of Allah (SWT), but human beings do not understand their exaltation:

﴿تُسَبِّحُ لَهُ السَّمَاوَاتُ السَّبْعُ وَالْأَرْضُ وَمَنْ فِيهِنَّ وَإِنْ مِنْ شَيْءٍ إِلَّا يُسَبِّحُ بِحَمْدِهِ وَلَكِنْ لَا تَفْقَهُونَ تَسْبِيحَهُمْ إِنَّهُ كَانَ خَلِيمًا غَفُورًا ۝٤٤﴾ (الإسراء: 44)

«The seven heavens and the earth and whatever is in them exalt Him. And there is not a thing except that it exalts [Allah] by His praise, but you do not understand their [way of] exalting. Indeed, He is ever Forbearing and Forgiving (Al-Isra: 44) »

This makes us suggest another proposition as follows:

Proposition 8

The main created divine quality that acts as a polar attractor around which other created divine qualities are arranged in the created soul system is *Iman*. The soul combines with the human body in this ideal state of arrangement leading to the emergence of the human *self* in what the holy Qur`an calls the creation of man in the best fashion (أحسن تقويم). However, this ideal systemic arrangement with which every person is born can be changed in human systems during the course of individual life through the mischievous exercise of other qualities, e.g., will, competence, power, knowledge, choice...etc., to rearrange these qualities around an opposite polar attractor, namely human ego (whim - Kufir).

Proposition 9

In their ideal state of arrangement around *Iman* the created divine qualities in the soul system are directly linked to their original divine source. In this ideal state they play two primary roles in the human sphere, one *functional* and the other *spiritual*. In their functional role the created divine qualities are both pervasive and ubiquitous as the furniture of the mundane life of individuals in the human sphere, so much so that humans take it for granted. For example, without the divine qualities of 'seeing', 'hearing' and 'power' the human body is powerless to be of any utility; without the divine qualities of 'creativity', 'knowledge' and other relevant qualities humans could have not transformed natural raw material into useful products, e.g., food, clothes, furniture, and technology. Without the qualities of 'mercy', 'cordiality' and 'patience' no

family life could be possible...etc. Out of divine providence this functional role is carried out by the soul system whether its elements of divine qualities are arranged around the polar attractor (*Iman*), or the polar attractor (*Kufr-Whim*). Under the latter the created divine qualities are severed from their divine source that enhances their causal powers beyond their created relative endowments. When whims rule supreme, relative created divine qualities like power (القوة), might (الجبرة), majesty (الملك) ...etc., could seduce man to declare himself God as the Holy Qur`an tells us. Instead of using them as causal powers to play their role in the establishment of *Tawhid* as a social system on earth incumbent on man as vicegerent, they become a source of arrogance and tyranny giving rise to psychological states and patterns of behaviour that destabilize social life. This is true of many of the relative divine attributes bestowed on man when they are arranged around the polar attractor 'Kufr-Whim' and man turns away from the divine message as the following verse tells us:

﴿قَبْلَ عَسَيْتُمْ إِنْ تَوَلَّيْتُمْ أَنْ تُفْسِدُوا فِي الْأَرْضِ وَتُقْطِعُوا أَرْحَامَكُمْ ۚ﴾ (محمد)

«So would you perhaps, if you turned away, cause corruption on earth and sever your [ties of] relationship? 22» (Muhammad)

In their *spiritual* role the divine qualities of the human soul system are always ideally arranged around the polar attractor 'Iman'. In this spiritual role they become the furniture for "good deeds" and actions expected from believers in every walk of daily mundane life. They also become the basis of social relations. Here the functional and spiritual roles become identical and the relative endowments of causal powers of the properties of the soul system are enhanced in various degrees by their original divine source. However, this enhancement depends on the quality of the good deeds performed by believers and therefore, the degree and quality of their *Iman*. Believers are encouraged to compete with each other for excellence and for the corresponding expected rewards.

The following authentic Hadith corroborates this last aspect of proposition 9.

عن أبي هريرة رضي الله عنه قال: قال رسول الله، صلى الله عليه وسلم: «إِنَّ اللَّهَ قَالَ: مَنْ عَادَى لِي وَلِيًّا فَقَدْ آذَنْتُهُ بِالْحَرْبِ، وَمَا تَقَرَّبَ إِلَيَّ عَبْدِي بِشَيْءٍ أَحَبَّ إِلَيَّ مِمَّا افْتَرَضْتُ عَلَيْهِ، وَمَا يَزَالُ عَبْدِي يَتَقَرَّبُ إِلَيَّ بِالنَّوَافِلِ حَتَّىٰ أَحْبَبْتُهُ، فَإِذَا أَحْبَبْتُهُ: كُنْتُ سَمْعَهُ الَّذِي يَسْمَعُ بِهِ، وَبَصَرَهُ الَّذِي يُبْصِرُ بِهِ، وَيَدَهُ الَّتِي يَبْطِشُ بِهَا، وَرِجْلَهُ الَّتِي يَمْشِي بِهَا، وَإِن سَأَلَنِي لِأَعْطِيْتَهُ، وَلَنْ

استعاذني لأُعيذَنَّهُ، وما تردَّدتُ عن شيء أنا فاعلهُ تردُّدي عن نفس المؤمن، يكره الموت وأنا أكره مساءته». [صحيح] -
[رواه البخاري]

Abu Hurayrah (may Allah be pleased with him) reported that the Prophet (may Allah's peace and blessings be upon him) said: "Verily Allah said: 'Whoever shows enmity to a pious worshiper of Mine, I declare war against him. My slave does not draw near to Me with anything dearer to Me than what I have made obligatory for him. My slave continues to draw near to Me by doing supererogatory deeds until I love him. When I love him, I become his hearing with which he hears, his sight with which he sees, his hand with which he strikes, and his foot with which he walks. Were he to ask Me for something, I would surely give it to him, and were he to seek refuge with Me, I would surely grant him refuge. I do not hesitate to do anything as I hesitate to take the soul of the believer, for he hates death, and I hate to hurt him.'" [Al-Bukhari]

Proposition 10

The human soul system is the foundation of human systems of *value, morality, ethics, and esthetics* in the Qur`anic worldview. Since it is a component part, together with *matter*, of the human being as a macro system it can be studied scientifically using appropriate scientific methods of science. The divine properties in their relative creation become part of the dispositional properties of the *self that emerge* out of the intense interaction between the material body system and the soul system as we will reason in the next chapter. They should be studied as constellations relevant to particular domains of individual and social life. The most obvious constellation of divine properties is that relevant to perception, e.g., seeing, hearing, and knowing.

Proposition 11

Based on the holy Qur`an, consciousness is pervasive in nature, so much so that even birds and ants have languages of their own and understand what is going on in the human domain. Under certain circumstances they can communicate this understanding to human beings as the holy Qur`an tells us in the story of prophet Sulaiman, peace and blessings of Allah be upon him, in his verbal communication with the bird of '*Al-Hudhud*' and his smile when he heard and understood the warning sent by an ant to the rest of the colony to beware the approaching army of Sulaiman.

The metaphysics of the soul system grounded on revelation and post-

modernist science and summarized in the above eleven propositions shows that the ontological presence of consciousness in the cosmos is as primordial as matter. This means that from the perspective of the Qur`anic worldview our knowledge of the world will be severely limited if we approach it from the perspective of the philosophy of scientific realism and other materialist perspectives adopted by modern science in the natural and social domains of reality. A wholistic approach to the production of knowledge based on the interaction between the material and the soul systems that leads to the emergence of things which make the furniture of the world is called for. The present author will attempt this approach in the next and last chapter of this book under the title: *Towards a General Theory of Social Systems*.

From Fig. 4 we distinguish two primary levels of creation: the world of the *visible* and the world of the *invisible*. The invisible world is constituted of five entities that occupy five different levels, these are: *Paradise; Hell; Angels; Jinn and Barzakh Spirits*. Jinn are created from *flames* of fire as stated in the holy Qur`an, and Angels are created from *light* as narrated by the authentic *prophetic hadith*. Since both *fire flame* and *light* are two different types of *energy* it follows that *energy* is a constitutional aspect of the substrata of both Angels and Jinn, with a difference in the type of energy of which each is created.

An important question arises: if, according to Bunge "*x is material is tantamount to x has energy and x is changeable*", can we say that both Angels and Jinn have material component, beside the soul component, in their constitution though the structural relationship within and between these subsystems is not knowable to us? This will be a very useful result because it means we can study scientifically using appropriate methods the effects of the interaction between these invisible entities and human beings without resorting to esoteric narrative. This is because they are created from the same substances as humans but the structuring of their substances makes these entities invisible to us.

All the created entities that make the invisible world play a role in shaping the interiority of human beings and consequently their worldviews. Some of them like Jinn and Angels have causal powers through which they directly influence humans and others like paradise and hell fire influence human psychology through the narratives about them particularly from holy sources like the holy Qur`an, and prophetic traditions. Now scientific evidence is

accumulating about the ability of living humans with special training (*spiritual mediums*) to contact the spirits of the dead in the Barzakh world. This contact is also possible according to Islam through dreams during deep sleep when the “self” leaves the body temporally and joins the world of the invisible and returns later to the body in the process of waking as the following verse tells us:

﴿اللَّهُ يَتَوَفَّى الْأَنْفُسَ حِينَ مَوْتِهَا وَالَّتِي لَمْ تَمُتْ فِي مَنَامِهَا فَيُمْسِكُ الَّتِي قَضَىٰ عَلَيْهَا الْمَوْتَ وَيُرْسِلُ الْأُخْرَىٰ إِلَىٰ أَجَلٍ مُّسَمًّى إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٤٢﴾ [الزمر]

«Allah takes the souls at the time of their death, and those that do not die [He takes] during their sleep. Then He keeps those for which He has decreed death and releases the others for a specified term. Indeed, in that are signs for a people who give thought» (Az-Zumar: 42)

The level of the *visible* world is inhabited by familiar cosmic entities with one exception, the *holy Qur'an*, which is a closed text system, but open as a conceptual system. The uniqueness of the *holy Qur'an* is that it is not a man-made conceptual system so that it can be incorporated into the social domain of reality. The holy Qur'an is a divine revelation constituted of apodictic knowledge about everything. However, because it has been revealed to earthly humans by Allah SWT and no one can change it as a text, it has become an entity of its own in the visible world and occupies a separate level of reality.

Levels of various types of reality have been identified by science in the visible world which I alluded to in the previous chapters of this book. All the entities that occupy these levels in the visible world are causally interconnected and also connected to the entities in the invisible world. There is, of course, the instant and permanent relationship between the Creator, Allah (SWT) and His creation.

Chapters one and three of this book contain a summary of the ontological propositions made by Critical Realism in terms of vertical and horizontal depth, implying three domains of reality: *the real*; *the actual* and *the empirical*, in addition to the proposition of the *stratification of reality*, as well as the *postulates of systemism* that ground the ontology of Bunge and their methodological implications for IOK. These ontological and methodological theories lend a very strong scientific support to the approach we find in the Qur'anic

Worldview (QWV) of explaining events, natural and social, that take place in the domain of social reality and of concern to contemporary humanity. The following example from the holy Qur`an, which I call “*The Saba` Phenomenon*”, is a paradigmatic case of the systems` approach to the study of phenomena in the QWV depicted in Fig. 4 above.

﴿لَقَدْ كَانَ لِسَبَإٍ فِي مَسْكِنِهِمْ آيَةٌ جَنَّتَانِ عَنْ يَمِينٍ وَشِمَالٍ كُلُوا مِنْ رِزْقِ رَبِّكُمْ وَاشْكُرُوا لَهُ بَلْدَةٌ طَيِّبَةٌ وَرَبٌّ غَفُورٌ ۝١٥﴾
 ﴿فَأَعْرَضُوا فَأَرْسَلْنَا عَلَيْهِمْ سَيْلَ الْعَرِمِ وَبَدَّلْنَاهُمْ بِجَنَّتَيْهِمْ جَنَّتَيْنِ ذَوَاتِي أُكُلِ حَمْطٍ وَأَثَلٍ وَمَشْيٍ مِنْ سِدْرٍ قَلِيلٍ ۝١٦﴾ ذَلِكَ
 جَزَاءُكُمْ بِمَا كَفَرْتُمْ وَهَلْ نُحْزِيهِ إِلَّا الْكَافِرُونَ ۝١٧﴾ ﴿وَجَعَلْنَا بَيْنَهُمْ وَبَيْنَ الْقُرَى الَّتِي بَرَكْنَا فِيهَا فَرْقًا وَلَقَدْ رَمَّا فِيهَا السَّيِّرَ
 سَيْرُوا فِيهَا لِيَالِي وَأَيَّامًا ءَامِينِينَ ۝١٨﴾ ﴿فَقَالُوا رَبَّنَا بَعْدَ بَيْنِ أَسْفَارِنَا وَظَلَمُوا أَنْفُسَهُمْ فَجَعَلْنَاهُمْ أَحَادِيثَ وَمَرَّقْنَاهُمْ كَلًّا مُرَقًّى
 إِنَّ فِي ذَلِكَ لَآيَاتٍ لِكُلِّ صَبَّارٍ شَكُورٍ ۝١٩﴾ ﴿وَلَقَدْ صَدَقَ عَلَيْهِمْ إِبْلِيسُ ظَنَّهُ فَاتَّبَعُوهُ إِلَّا فَرِيقًا مِنَ الْمُؤْمِنِينَ ۝٢٠﴾ ﴿وَمَا كَانَ لَهُ
 عَلَيْهِمْ مِنْ سُلْطَانٍ إِلَّا لِنَعْلَمَ مَنْ يَأْتِيهِ بِالْحَرَّةِ مِمَّنْ هُوَ مِنْهَا فِي شَكٍّ وَرَبُّكَ عَلَى كُلِّ شَيْءٍ حَفِيظٌ ۝٢١﴾ [سبأ]

«There was for [the tribe of] Saba` in their dwelling place a sign: two [fields of] gardens on the right and on the left. [They were told], «Eat from the provisions of your Lord and be grateful to Him. A good land [have you], and a forgiving Lord.»(15) » «But they turned away [refusing], so We sent upon them the flood of the dam, and We replaced their two [fields of] gardens with gardens of bitter fruit, tamarisks and something of sparse lote trees (16) » «[By] that We repaid them because they disbelieved. And do We [thus] repay except the ungrateful? (17) » «And We placed between them and the cities which We had blessed [many] visible cities. And We determined between them the [distances of] journey, [saying], «Travel between them by night or day in safety.»(18) » «But [insolently] they said, «Our Lord, lengthen the distance between our journeys,» and wronged themselves, so We made them narrations and dispersed them in total dispersion. Indeed, in that are signs for everyone patient and grateful (19) » «And Iblees had already confirmed through them his assumption, so they followed him, except for a party of believers (20) » «And he had over them no authority except [it was decreed] that We might make evident who believes in the Hereafter from who is thereof in doubt. And your Lord, over all things, is Guardian (21) » [Saba: 15-21].

I have no intention here of expounding in detail the systemic methodological implications of the ‘*Phenomenon of Saba`*’ narrated in these verses of the holy Qur`an. I just want to enumerate the elements of the systemic explanation included in this historical social phenomenon. They are as follows:

Firstly, we have a human social system (*Saba` society*) with its micro-macro relationship, where the events mentioned by the verses had taken place.

The micro components of the system consist of the individual members of the society, while the macro social system is made of its main aspects: *bio-social system, knowledge system, economic system, political system* and the *cultural system*. The dominant worldview in this society was secular because the society was completely oblivious to the presence and influence of the *Invisible World* {Allah (Angels, Jinn, paradise, hell)};

Secondly, a conducive natural, technological and agricultural material production environment (gardens, water, dams, fruits. etc.) within which the social system is embedded, i.e., a lower level of reality on which the existence of the higher social level depends;

Thirdly, the Invisible World revealed itself to the Saba` society as a supra level of reality on which all levels of reality in the Visible World depend, but the opposite is not true. Allah (SWT) brought down revelation to Saba` with a reminder message which they had to react to in terms of social actions. This reaction led to a dramatic sequence of events at all levels of reality in the visible world, in the social and natural domains of Saba` as the holy Qur`an tells us. The initial conducive conditions for the good life enjoyed by the Saba` society had been turned upside down by momentous events: climate change that led to destructive floods and prolonged droughts; change in the biosphere that led to new poor types of crops; demographic and social changes as a result of diaspora...etc.

The upshot of the Saba` phenomenon is that it is not a unique historical chain of catastrophic events but a recurring phenomenon throughout recorded human history and has never been starker than what it is in our 21st century. Therefore, the explanatory framework that could be developed from the QWV, which I believe is systemic, based on the way the holy Qur`an explained the ensuing events of Saba` should be a valuable contribution to the systems approach that studies social reality. An attempt will be made by the author in the next and last chapter of this book to outline this QWV framework.

Most of the entities that occupy the different levels of reality, both in the visible and the invisible world, represented in Fig. 4, are involved in the generation and, therefore, the explanation of the events that make the Saba` phenomenon. These include, in the visible world, physical; chemical; biological; psychological and social entities. The involvement of the invisible

level is represented by *Iblis* and his progeny (Satan) and also by *Angels* as messengers of Allah (SWT) carrying His commands and implementing His will on the people of Saba`. Then Allah (SWT) is omnipotent and all-encompassing of these myriads of causal powers.

The ontological depth of the *real*, the *actual* and the *empirical* domains of reality is relevant here, for what appears to our perception in the Saba` phenomenon is but a conjunction of events (change in climate, in biosphere, in demography, floods, desertification, migration. etc.). *Empiricists* and *Idealists* seek scientific explanation at this empirical level only and take conjunction of events and ideas as explanatory laws. This is called the *epistemic fallacy* by *Critical Realism* which seeks explanation at the *real level* where, in the case of the Saba` phenomenon, the structures and mechanisms of the causal powers in the invisible and visible worlds that generate these events interact, vertically and horizontally.

We can now imagine the amount of specialized knowledge we need about each entity and the integration of such knowledge to gain a wholistic understanding, from the perspective of the QWV, of any phenomenon of the like of Saba`. This is integration via differentiation.

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تم بحمد الله



Chapter 5

Towards A General Theory of Social Systems (1) **THE EMERGENCE OF MAN: AN ISLAMIC PERSPECTIVE**

1- Introduction: Self-organization in Complex Systems

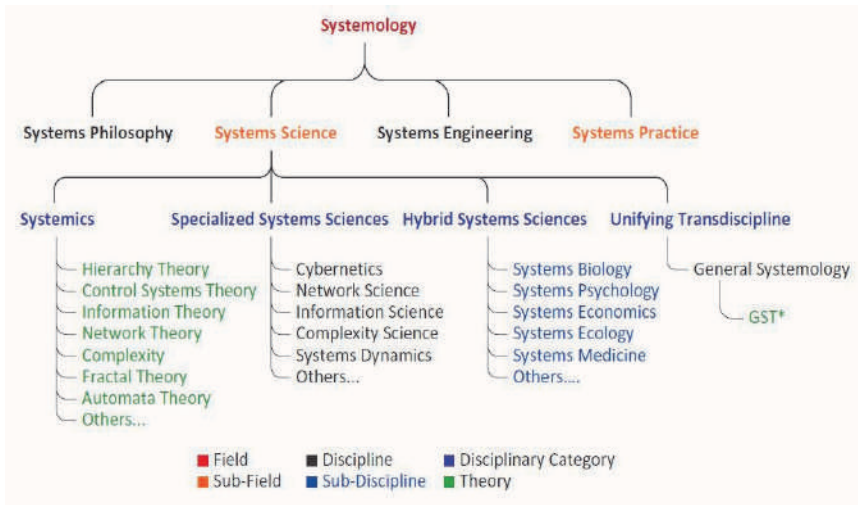
Chapters 1, 2 and 3 of this book have introduced the systems` approach to the study of *Reality* - natural and social - in terms of its "*ontological*", "*epistemological*" and "*methodological*" dimensions. Chapter 4 introduced an Islamic perspective of the systems` approach in terms of a *Qur`anic Worldview* (QWV) deemed necessary as a guiding framework towards developing a fully-fledged systems knowledge reflecting the Islamic perspective. The systems approach to the production of knowledge is a frontier area in Western academia and is still at an early stage of development. Its main drive is integration of knowledge (*IOK*) to tackle complex problems which are a challenge to humanity in the 21st century and that cannot be studied and understood by mono-disciplines.

Fig. 1 below shows the disciplinary structure of the systems knowledge which we have discussed in detail in chapter 2 of this book. The main challenge facing its credibility as a unified science is the development of a "*General Systems Theory*" that could serve as a nucleus to a general systems discipline "*General Systemology*" which will integrate the knowledge produced in the entire field of systems science.

In chapter 2 of this book, I have given the reasons why I think we should situate the project of Islamic Integration of knowledge (*IIOK*) within the global framework being developed to tackle the problem of integration of knowledge (*IOK*) which is the systems framework. Towards realizing this

objective, I tried to develop a model of the Qur`anic worldview QWV - Fig. 2 - that could be used as a springboard for developing the Islamic perspective on systems knowledge. Nonetheless, I neither have the intention nor the capacity to engage in the task of presenting an Islamic viewpoint on a general systems theory. This, as I surmise, is a duty that falls upon Muslim scholars specializing in natural and formal sciences. Being a social scientist, my attempt in this and in the next last chapter will be limited to sketching an outline of a hybrid *General Theory of Social Systems* which could have the potential of being developed into a more elaborate theory that forms the basis of an Islamic perspective on the prospective discipline of “*General Systemology*”. This theory is intended as a unifying framework for all the social sciences that could potentially spring from QWV.

Fig 1: General Systemology



Source: Rousseau; General Systemology

According to the systems literature surveyed in the first three chapters above:

1. A social system is a concrete system composed of gregarious animals that
 - (a) share an environment;
 - (b) act upon other members of the system; and
 - (c) cooperate in some respects and compete in others.

2. A human social system is a social system composed of human beings and their artifacts, held together by feelings, beliefs, moral and legal norms, and mutually related actions.
3. A human social system can be (a) natural (spontaneous) if it emerges by way of free association or reproduction (e.g., families, circle of friends, street-corner gangs); (b) formal (designed) if it is formed in compliance with explicit rules or plans (e.g., schools, armies, business firms, political parties, NGOs).
4. A human society is a social system composed of four major subsystems: (a) biosocial system, whose members are bound together by sexual, kinship, and friendship relations; (b) economic system, the bonds of which are relations of production and exchange; (c) political system, characterized by the coordination and management of social activities and the struggle for power; and (d) cultural system, the members of which engage in cultural or moral activities like learning, teaching, inventing, designing, singing, painting, and so on.

The system concept presupposes the concept of organizational relations. Without conceiving them, no system can be conceived. Accordingly, these relations integrate the elements of a system, and they do so in a specific way, which makes the systems comparable with, and distinguishable from, each other at the same time: You can look for organizational relations in any system, and in each system the organizational relations will look different. The relations of organization in a system – though endowed with the properties of having been caused by a dynamic interaction of the elements of the system and of exerting causative power on the behaviour of each element in which the relations manifest themselves – are not observable, in contrast to the dynamic interaction or the behaviour of the elements. These relations need to be construed theoretically, and they are necessary in promoting understanding and explaining the empirical data of interaction and behaviour – data that would be senseless without interpretation in the light of organizational relations. One cannot conclude from empirical data on theoretical knowledge in a deductive way. Once certain organizational relations have been hypothesized, however, the construct can be corroborated by facts.

In social systems, the theoretical construct that specifies organization and

order is known as *social relations*. Social relations, however, might be conceived in different ways. In order to properly apply the systems perspective, social relations must not be conflated with *social interaction* or human behaviour and have to be conceptualized as being different. At the same time, social relations need to be reconnected with interaction and behaviour. Accordingly, the application of systems thinking should work as an attempt to integrate *agency* with *structure* and to reconcile ideas that overemphasize the first aspect with those that overemphasize the second aspect. Structure shall not be reduced to, or projected onto, agency, nor shall agency and structure be unrelated differences.

Systems are hierarchically layered. We distinguish the level of the parts, comprising those parts as entities together with their behaviour and interaction, from a level on which these organizational relations are situated. We call the level of the parts the *micro level* of the system in question and call the level of the whole the *macro level* of that system. This allows the inclusion of both levels within the system. There is a bottom-up process in which the interactions of elements, or proto-elements in the case of emerging systems, cause the emergence of relations of organization that become solidified on a higher level. Equally, there is a top-down process in which these solidified organizational relations exert a causal power on the activities of the elements. Thus, after the forming of a system, that very system maintains itself such that, through downward causation, its organizing relations make its elements produce the system itself anew. And the elements – through upward causation letting organizational relations emerge – maintain themselves by making the system organize relations for the production of the elements. This is called *self-organization*.

“Reality, in the modern conception, appears as a tremendous hierarchical order of organized entities, leading, in a superposition of many levels, from physical and chemical to biological and social systems... the notion of emergence is essentially correct: each higher level presents new features that surpass those of the lower levels”
(Bertalanffy, 1959, p. 67)¹¹

The components or agents of a complex system initially interact only locally,

11 - Quoted in Hofkirchner: Social relations: Building on Ludwig von Bertalanffy

i.e., with their immediate neighbors. The actions of remote agents are initially independent of each other: there is no correlation between the activity in one region and the activity in another one. However, because all components are directly or indirectly connected, changes propagate so that far-away regions eventually are influenced by what happens here and now. Because of the complex interplay of positive and negative feedbacks, this remote influence is very difficult to predict and may initially appear chaotic. However, the outcome of interactions is not arbitrary, but exhibits a *preference* for certain situations over others.

“The principle is analogous to natural selection: certain configurations are intrinsically “fitter” than others, and therefore will be preferentially retained and/or multiplied during the system’s evolution. When the agents are goal-directed, the origin of this preference is obvious: an agent will prefer an outcome that brings it closer to its goals. For example, in a market a firm will prefer the outcome that brings it more profit. In an ecosystem, an animal will prefer an outcome that brings it more food, or that reduces its risk of being attacked by a predator. But even inanimate, physical objects, such as molecules or stones, have an in-built “preference”, namely for the state that minimizes their potential energy. Thus, a stone “prefers” the stable state at the foot of a hill to an unstable state on the top. Here, “preference” simply means that the unstable state will sooner or later be abandoned, while the stable one will be retained.”¹²

Given such a preference for the *fittest configuration* by a system and its elements, it is clear why an individual element tends to “organize” itself so as to settle down in its preferred situation. The problem is that what is best for one element is in general not best for the other elements. For example, more profit for a firm generally means less profit for its competitors, and an animal safe from attack by a predator means a predator that goes hungry. However, interaction is in general not a *zero-sum game*: a gain by one party does not necessarily imply an equivalent loss by the other party. In most cases, an outcome is possible in which both parties to some degree gain. In that case, we may say that the interaction exhibits *synergy*: the *outcome* is *positive* for all parties; all involved agents *prefer* the outcome to the situation without the interaction.

In general, such a collective solution is still a compromise, in the sense that not all agents can maximally realize their preferences. Not all the stones can end up in the same, lowest spot at the bottom of the hill, but they can all end up much lower than they were, by reducing the irregular hill to an even plain. Such a compromise reduces the tension or “conflict” between competing agents. Such conflict would otherwise lead to instability as every action of the one triggers a counteraction by the other. In that sense, we may say that the agents have *mutually adapted*; they have *coordinated* their actions so as to *minimize friction* and *maximize synergy*. The achievement of this stable, synergetic state is in general a process of *trial-and-error* or *variation-and-selection*. Because agents are independent and interact locally, and because the dynamics of the system is unpredictable, they in general do not know what the effect of their actions on the other agents will be. They can only try out actions because they appear plausible, or even choose them at random, and note which ones bring them closer to their goals. Those actions can then be maintained or repeated, while the others are abandoned. This is the fundamental dynamics of natural selection.

To shift from *local coordination* to *global organization*, we just need to note that all interactions between all agents in the complex system will tend towards such a coherent, stable state, until they are all mutually adapted. This process generally accelerates because of *positive feedback*. The reason is that if two or more agents have reached a *mutually fit state*, this defines a stable assembly to which other agents can now adapt, by trying to “fit” into the assembly as well. The larger the assembly, the more “*niches*” it has in which other agents can fit. The more agents join the assembly, the larger it becomes, and the more niches it provides for even more agents to join. Thus, the assembly may grow exponentially until it encompasses the global system.

Let us now consider the system as a whole, rather than the agents individually. We notice that the system too undergoes a *process of variation*. This can be seen as an exploration by the system of different *regions* of its *state space*, thus following an intricate trajectory. The state space of the system is merely the Cartesian product of the state spaces of all its components. Self-organization then means that the system reaches an *attractor*, i.e., a part of the state space that it can enter but not leave. In that sense, an *attractor* is a *region* preferred by the *global dynamics*: states surrounding the attractor - the *attractor basin* - are unstable and will eventually be left and replaced by states inside the attractor.

A *non-linear system* has in general a multitude of *attractors*, each corresponding to a particular *self-organized configuration*. If the system starts out in a *basin* state, it will necessarily end up in the corresponding attractor, so that the long-term behavior can in principle be predicted - assuming we know what the attractor is, which is generally not the case. However, if it starts out in a state in between basins, it still has a *choice* about which basin and, therefore, which attractor it ends up in, and this will depend on unpredictable fluctuations. An attractor generally does not consist of a single state, but of a subspace of states in between which the system continues to move. The *self-organized configuration*, while more stable than the configuration before self-organization, is therefore in general not static but full of on-going activity.

Self-organization can be accelerated by augmenting the initial variation that makes the system explore its state space: the more different states it visits, the sooner it will reach a state that belongs to an attractor. The simplest way to increase such variation is to subject the system to random perturbations. For example, if you shake a pot filled with beans, the beans will explore a variety of configurations, while tending to settle into the one that is most stable, i.e., where the beans are packed most densely near the bottom of the pot. Thus, shaking will normally reduce the volume taken in by the beans.

The *pattern* formed by the stabilized interactions, *mutual fittings*, or *bonds* between the agents determines a *purposeful* or *functional structure*. Its function is to *minimize friction* between the agents, and thus *maximize* their *collective fitness*, *preference* or *utility*. Therefore, we may call the resultant pattern *organization*: the agents are organized or coordinated in their actions so as to maximize their *synergy*. However, such organization by definition imposes a *constraint* on the agents: they have lost the freedom to visit states outside the attractor, i.e., states with a lower fitness or higher friction. They have to obey new *rules*, determining which actions are allowed, and which are not. They have lost some of their *autonomy*. The ensuing mutual dependency has turned the collection of initially independent agents into an organization, i.e., a *cohesive whole* that is more than the sum of its parts. The *goal* of this whole is to *maximize overall synergy* rather than *individual utility*. In a sense, the agents have turned from *selfish individualists* into *conscientious cooperators*. They have become *subordinated* to the *regulations* of the *collective*.

This whole has *emergent* properties, i.e., properties that cannot be reduced to the properties of its parts. For example, a cell has the property of being alive, while the molecules that constitute it lack that property; gold has the properties of being shiny, malleable and yellow, but these properties do not exist for individual gold atoms. Rather than the parts individually, emergent properties characterize the pattern of interactions or relations between them. They typically include *global* or *holistic* aspects, such as *robustness*, *synergy*, *coherence*, *symmetry* and *function*.

Different attractor *regimes* imply different properties (causal powers) for the system obeying that regime. Since it cannot be *a priori* predicted which attractor the system will end up in, the emergent properties of the whole cannot be derived from the properties of its parts alone. Once the attractor regime has stabilized, the behavior of the parts is rather regulated or constrained by the properties of the higher-level whole. This is called *downward causation*. While the self-organized whole is intrinsically stable, it is still flexible enough to cope with outside perturbations. These perturbations may push the system out of its attractor, but as long as the deviation is not too large, the system will automatically return to the same attractor. In the worst case, the system is pushed into a different basin but that will merely make it end up in a different attractor. In that sense, a self-organizing system is intrinsically *adaptive*: it maintains its basic organization in spite of continuing changes in its environment. As noted, perturbations may even make the system more robust, by helping it to discover a more stable organization.

What is the reason for the existence of complex, self-organizing systems? The answer is that systems are formed and then maintained if proto-elements, and as long as elements, benefit from the system. Self-organizing systems emerge through organizational relations when cooperation of agents allows for synergy effects; the provision and production of synergy are the *raison d'être* of any system: If the organizational relations are no longer able to provide and help the elements produce synergy, then the system will break down. This means that Systems Theory is *normative* too. It can describe spaces of possibilities that might or might not be realized by the agents. It can describe possibilities that lead from one state of the system to a state that better fulfills functions desired by the agents and marks a *higher order* of the system - in which case the higher order is a *good*. And it can describe *unsustainable* states

- which then are *evils* - and possibilities to get rid of dysfunctions harmful to agents. By describing goods and evils and how they can be set out for or left behind, systems thinking makes explicit that it is *value-laden* and crosses the border from description to prescription.

2- The Macro Social Systems of QWV

Four fundamental macro human social systems can be derived from the systemic QWV depicted in Fig. 2 below. They are: the general Natural Social System (Fig. 3); the *Tawhidi* Social System (Fig. 4); the Secular Social System (Fig. 5) and the hybrid Real-world Social System (Fig. 6). The model in Fig. 3 represents a theoretical construct of the human natural social system grounded on the assumption that before it starts functioning all its individual actors are in the ideal state according to which every human being is created by Allah (SWT) as stated by the Qur`anic verse:

﴿لَقَدْ خَلَقْنَا الْإِنْسَانَ فِي أَحْسَنِ تَقْوِيمٍ ۝﴾ (التين)

«We have certainly created man in the best of stature;(4)» (At-Tin).

This is the state we have modelled in the QWV, in chapter 4, as the state where the human soul system of the created divine attributes is ideally ordered around the divine attribute of “*Iman*” as the *attractor* of the system. The human body system is ideally fashioned to interact with this soul system in the womb of the mother and out of this interaction a new entity called “*Self*” emerges which is a system that possesses some novel properties that are absent from its material components. These properties are dual, some of them are material acquired from the body system, and some are emergent representing the soul system.

It is this emergent self, in its interaction with the human body, that gives every individual human being his individuality. The self with its dual dispositional properties of “*transgression*” and “*piety*” is ideally suited for the test that every human being has to go through in this worldly life. This test is that of doing good in the worldly pleasures of “*wealth*” and “*children*” with which earth is endowed as resources to be managed by man as vicegerent. More will be said about this in the next sections of this chapter when we deal with the *emergence* of man and his social systems. What is important here is that this

ideal state according to which every man is fashioned represents the *ground state* from which every individual starts his adventure in worldly life. His life trajectory develops along or in between two polar paths: the *strait path* defined by his Creator; the *path of whims*, which is the path of Satan, the avowed enemy of man and of his Creator. The Holy Qur`an identifies “whims” as the chosen god of man when he declines the message of his Creator. By “whims” we mean the totality of the innate biological and psychological cravings that drive man towards the indulgence in worldly pleasures, and guide his goals and actions in life. In the language of complex systems, we may say that the life of the individual human being, in his wholeness as a complex system (self, body, environment), defined by his actions and interactions, oscillates between two attractors: *Iman* and *Kufr*, with *Shirk* as an in-between state space. This is also reflected in the main social systems (organizing social relations) resulting from this polarity in the attractors, namely the *Tawhidi* Social System, the Secular Social System and hybrid Real-world social system. All these intricate issues are well captured by the flow chart of QWV in Fig. 2, columns A, C and B respectively. Elaboration on these issues will follow in the remaining sections of this chapter and in the next last chapter, *insha’Allah*.

The human social system is defined here as *natural* if no divine *Revelation* is brought down by Allah (SWT) to the actors in the system according to which they have to make a deliberate choice between believing in Allah SWT and thus design and structure their social system according to His sacred injunctions, or disbelieve and design their social system on the basis of discordant alternatives. The analytical value of the assumed natural social system is that it enables us to have an idea about the true nature of human beings and thus their expected actions in different situations beside the social structures and processes that propel the evolution of the social system in the absence of any divine guidance. Furthermore, we can examine the interplay between those mechanisms that advance, maintain or dismantle the system and the conditions which enable the system to achieve social self-organization as defined in the previous section. All these analytical gains will help us understand the functioning of the other social systems which are but the limits to the natural social system when the latter responds to divine revelation either by completely embracing it and thus we will have the case of the *Tawhidi* Social System (Fig. 4), or by completely rejecting it which will yield the Secular Social System (Fig. 5), or lastly, by half-half acceptance and

practice of the injunctions of Revelation which results in the Hybrid Social System (Fig. 6). The Hybrid Social System represents the real-world social systems.

The common denominator of these four macro social systems is the human being, whose actions and interactions at the micro level generate these macro social systems. Therefore, the next section will be about our attempt to use the approach of systemism developed by Bunge and detailed in previous chapters to explore the four micro systems that define the stages of the emergence of man, grounded on our understanding of QWV. They will be explored in terms of their *composition, structure, environment* and *mechanisms*. It is a preliminary study that awaits further elaborations. The emergence and dynamics of the four macro social systems will be examined in the next final chapter.

Fig. 2: Qur'anic Worldview

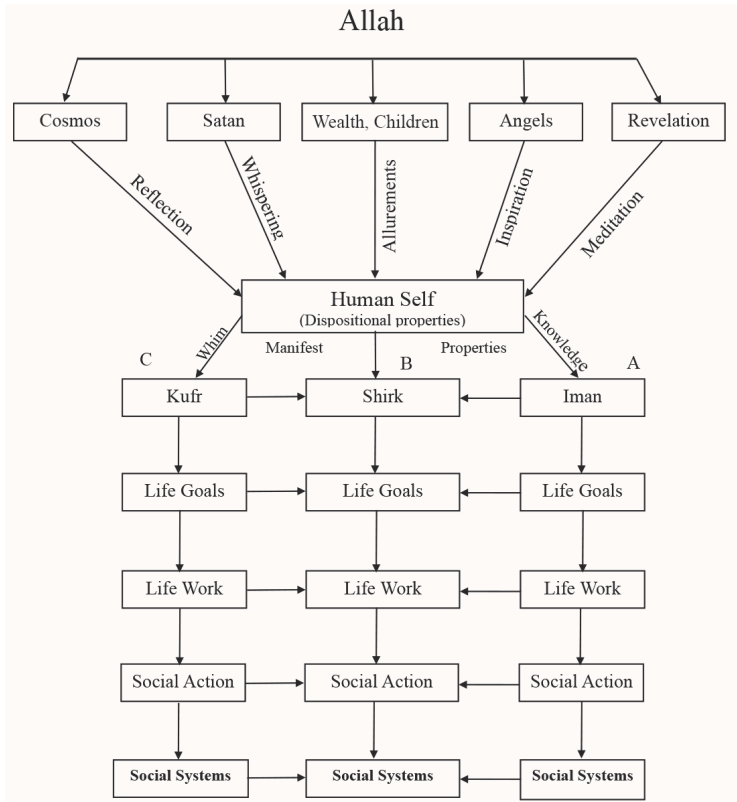


Fig. 3: Natural Social System

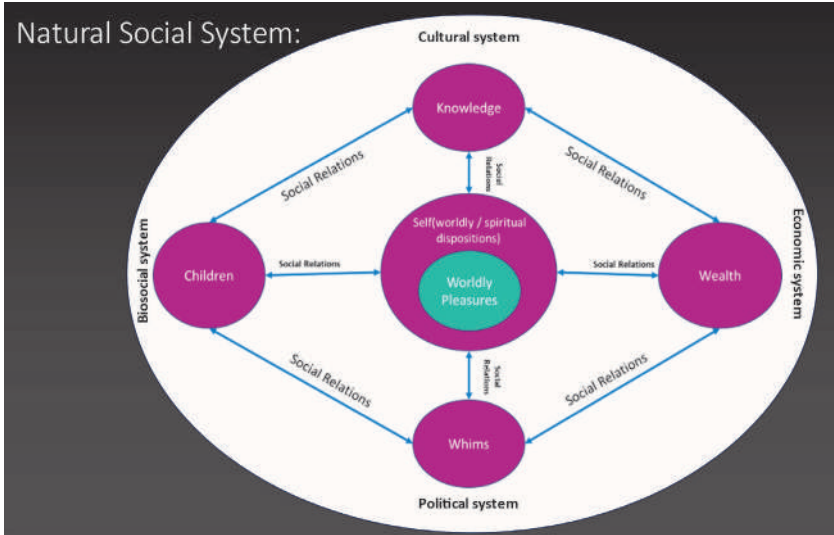


Fig. 4: Tawhidi Social System

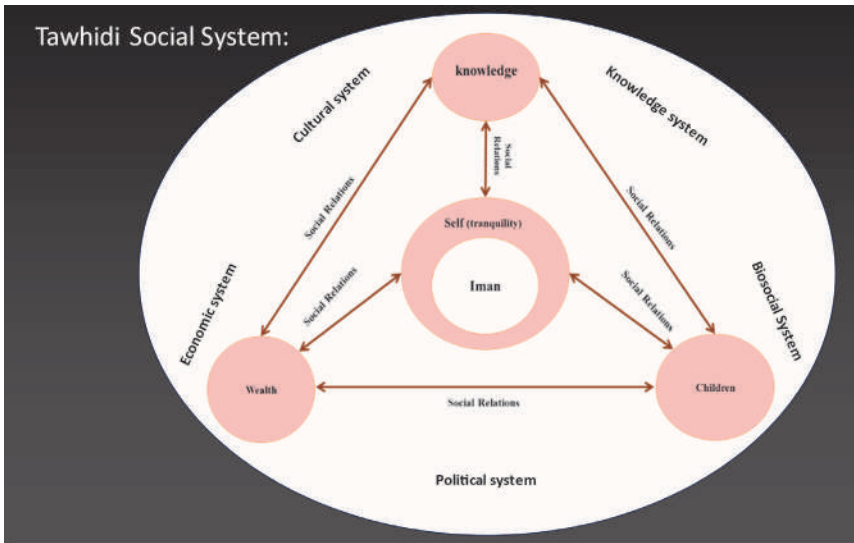


Fig. 5: Secular Social System

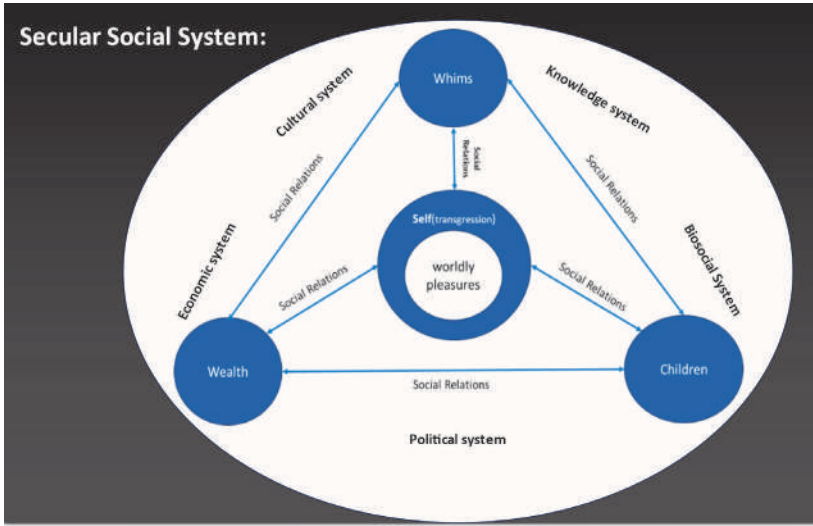
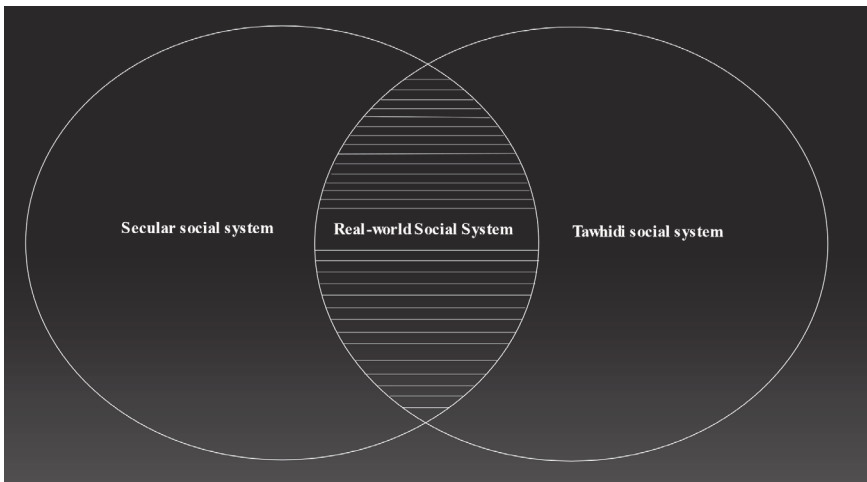


Fig. 6: Real-world Social System



3- The Emergence of Man in QWV

Since social systems are concrete entities resulting from the actions and interactions of individual human beings it is appropriate to start the enquiry by asking about the nature and origin of the human being as a concrete entity with generative causal powers (properties). This requires the recalling of two necessary concepts, the first is the concept of “*emergence*” which is pivotal in systems knowledge. In the chapter on ontology, we said the following about emergence:

The concept of emergence is inherently compositional. By this is meant that any higher-level entity (and its emergent properties) is dependent upon a collection of lower-level entities in the sense that (a) they are the necessary component parts of the higher-level entity; (b) the emergent properties are dependent upon, but not eliminatively reducible to, the properties of these parts; and (c) the emergent properties, in the sense of a power or tendency, are not dependent upon the properties of other entities that are not such parts, although it may be so dependent for its realization.

The second concept is what I have called the *Master Plan of Creation* (MPC) which the author has been developing for over thirty years with many publications, both Arabic and English. The MPC is now conveniently summarized by what I call the QWV which I detailed in chapter 4 and modelled by Fig 2 above. The MPC, having been derived from the Holy Qur`an, shows the divine wisdom behind creation in general and the place of man in this creation. Only when placed within the wider context of the MPC can we understand the purpose behind the unique and best stature according to which Allah SWT has created man. In the Holy Qur`an Allah SWT says:

﴿لَقَدْ خَلَقْنَا الْإِنْسَانَ فِي أَحْسَنِ تَقْوِيمٍ ۚ ﴿٤﴾ ﴿ثُمَّ رَدَدْنَاهُ أَسْفَلَ سَافِلِينَ ۝ ﴿٥﴾﴾ ﴿إِلَّا الَّذِينَ ءَامَنُوا وَعَمِلُوا الصَّالِحَاتِ فَلَهُمْ أَجْرٌ غَيْرُ مَمْنُونٍ ۖ ﴿٦﴾﴾ (التين)

«We have certainly created man in the best of stature;(4) Then We return him to the lowest of the low;(5) Except for those who believe and do righteous deeds, for they will have a reward uninterrupted;(6)» (At-Tin).

This oscillation of the life trajectory of man between the two extreme attractors of “*Iman*” and “*Kufr*” - Fig. 2 - can only be understood if examined in the context of the test ordained for man in the domain of the allurements of this

worldly life (wealth, children) which represents the core of the MPC. It is the nature of this test and the suitability of the stature of man for it which explains the tumultuous evolution of human history and gives value to the MPC as an analytical framework for social phenomena. The rest of this chapter is an attempt by the author to model the social dynamics of the MPC within a systemic framework. We deduce from the MPC that the creation of man passed through four stages of emergence before becoming in the best stature suitable for the test of “wealth” and “children” as “allurements” on earth over which he has been made vicegerent. Below is a sketch of these four stages of emergence examined in a chronological order.

3.1. - Emergence of the Human Body

The first stage in the emergence of man is that of his material biological body:

﴿وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ صَلْصَلٍ مِنْ حَمَلٍ مَسْنُونٍ ۚ﴾ (الحجر)

«And We did certainly create man out of clay from an altered black mud (26) » (Al-Hijr)

The human body is formed to achieve three tasks. As I see it, they are:

- (a) To combine and interact with the soul system that has been designed for it,
- (b) To go through the test that has been designed for man in his earthly life,
- (c) The preservation of human species through procreation, and human diversity through gene heredity as the Holy Qur`an tells us:

﴿وَإِذْ أَخَذْنَا مِنْ بُنَىٰ آدَمَ مِنْ ظُهُورِهِمْ ذُرِّيَّتَهُمْ وَأَشْهَدَهُمْ عَلَىٰ أَنفُسِهِمْ أَلَسْتُ بِرَبِّكُمْ قَالُوا بَلَىٰ شَهِدْنَا أَنْ تَقُولُوا يَوْمَ الْقِيَامَةِ إِنَّا كُنَّا عَنْ هَذَا غَافِلِينَ ۗ﴾ (الأعراف)

«And [mention] when your Lord took from the children of Adam - from their loins - their descendants and made them testify of themselves, [saying to them], “Am I not your Lord?” They said, “Yes, we have testified.” [This] - lest you should say on the day of Resurrection, “Indeed, we were of this unaware.”(172) » (Al- A`raf);

﴿ الَّذِي أَحْسَنَ كُلَّ شَيْءٍ خَلَقَهُ يُوَدِّدُ خَلْقَ الْإِنسَانِ مِنْ طِينٍ ۗ ﴿٧﴾ ﴿ ثُمَّ جَعَلَ نَسْلَهُ مِنْ مَائٍ مَّهِينٍ ۘ ثُمَّ سَوَّاهُ وَنَفَخَ فِيهِ مِنْ رُوحِهِ ۖ وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ ۗ قَلِيلًا مَّا تَشْكُرُونَ ۙ ﴿٩﴾ (السجدة)

« Who perfected everything which He created and began the creation of man from clay (7) Then He made his posterity out of the extract of a liquid disdained (8) Then He proportioned him and breathed into him from His [created] soul and made for you hearing and vision and hearts; little are you grateful (9) » (As-Sajdah);

﴿ وَلَقَدْ خَلَقْنَا الْإِنسَانَ مِنْ سُلَّةٍ مِّنْ طِينٍ ۙ ﴿١٢﴾ ﴿ ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَّكِينٍ ۙ ﴿١٣﴾ ﴿ ثُمَّ خَلَقْنَا النَّطْفَةَ عَلَاقَةً فَخَلَقْنَا الْعَلَاقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظْمًا فَكَسَوْنَا الْعِظْمَ لَحْمًا ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ ۖ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ۙ ﴿١٤﴾ (المؤمنون)

«And certainly, did We create man from an extract of clay (12) Then We placed him as a sperm-drop in a firm lodging (13) Then We made the sperm-drop into a clinging clot, and We made the clot into a lump [of flesh], and We made [from] the lump, bones, and We covered the bones with flesh; then We developed him into another creation. So blessed is Allah, the best of creators (14) » (Al-Mu'minin).

عن أبي عبد الرحمن عبد الله بن مسعود رضي الله عنه قال: حَدَّثَنَا رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ - وَهُوَ الصَّادِقُ الْمُسَدِّقُ -: «إِنَّ أَحَدَكُمْ يُجْمَعُ خَلْقُهُ فِي بَطْنِ أُمِّهِ أَرْبَعِينَ يَوْمًا نُطْفَةً، ثُمَّ يَكُونُ عَلَاقَةً وَمِثْلَ ذَلِكَ، ثُمَّ يَكُونُ مُضْغَةً مِثْلَ ذَلِكَ، ثُمَّ يُرْسَلُ إِلَيْهِ الْمَلَكُ فَيَنْفُخُ فِيهِ الرُّوحَ، وَيُؤَمَّرُ بِأَرْبَعِ كَلِمَاتٍ: بِكُتُبِ رِزْقِهِ، وَأَجَلِهِ، وَعَمَلِهِ، وَشَقِيٍّ أَمْ سَعِيدٍ؛ قَوْلَ اللَّهِ الَّذِي لَا إِلَهَ غَيْرُهُ إِنَّ أَحَدَكُمْ لَيَعْمَلُ بِعَمَلِ أَهْلِ الْجَنَّةِ حَتَّىٰ مَا يَكُونُ بَيْنَهُ وَبَيْنَهَا إِلَّا ذِرَاعٌ فَيَسْبِقُ عَلَيْهِ الْكِتَابُ فَيَعْمَلُ بِعَمَلِ أَهْلِ النَّارِ فَيَدْخُلُهَا. وَإِنَّ أَحَدَكُمْ لَيَعْمَلُ بِعَمَلِ أَهْلِ النَّارِ حَتَّىٰ مَا يَكُونُ بَيْنَهُ وَبَيْنَهَا إِلَّا ذِرَاعٌ فَيَسْبِقُ عَلَيْهِ الْكِتَابُ فَيَعْمَلُ بِعَمَلِ أَهْلِ الْجَنَّةِ فَيَدْخُلُهَا» (رواه البخاري ومسلم)

On the authority of Abdullah ibn Masood (ra), who said:

The Messenger of Allah (ﷺ), and he is the truthful, the believed, narrated to us, "Verily the creation of each one of you is brought together in his mother's womb for forty days in the form of a nutfah (a drop), then he becomes an alaqah (clot of blood) for a like period, then a mudghah (morsel of flesh) for a like period, then there is sent to him the angel who blows his soul into him and who is commanded with four matters: to write down his rizq (sustenance), his life span, his actions, and whether he will be happy or unhappy (i.e., whether or not he will enter Paradise). By the One, other than Whom there is no deity, verily one of you performs the actions of the people of Paradise until there is but an arm's length between him and it, and that which has been

written overtakes him, and so he acts with the actions of the people of the Hellfire and thus enters it; and verily one of you performs the actions of the people of the Hellfire, until there is but an arm's length between him and it, and that which has been written overtakes him and so he acts with the actions of the people of Paradise and thus he enters it.” (Bukhari & Muslim).

The human body is a biological system with dispositional properties that its components (cells) lack, e.g., walking, hearing, seeing, tasting, thinking etc. These potential properties of the body are activated and exercised when the other emergent stages of the human being are complete. Every human body has its own unique imprint not shared even by twins. The body is composed of elements that belong to at least four levels of reality; physical, chemical, biological and psychological with the social level representing an external environment.

The dominant Western scientific disciplines reduce man to his bodily composition and study him as a material system in the sense of Bunge's definition of being material. However, the accumulated anomalies in this area of science are forcing philosophers of science and practicing scientists to revise the dominant materialist paradigm and call for some sort of dualism that allows for a spiritual element in the composition not only of man but of all concrete reality.

3.2 - Emergence of the Human “Soul”

The second stage in the emergence of man, according to the holy Qur'an, is that of the “Soul”. The following verses from the holy Qur'an are of relevance here:

﴿وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلًا ۝٨٥﴾ (الإسراء)

«And they ask you, [O Muhammad], about the soul. Say, “The soul is of the affair of my Lord. And mankind have not been given of knowledge except a little.” (85) » (Al-Isra).

﴿وَإِذْ قَالَ رَبُّكَ لِلْمَلَائِكَةِ إِنِّي خَلِيقٌ بَشَرًا مِنْ صَلْصَلٍ مِنْ حَمَإٍ مَسْنُونٍ ۝٢٨
﴿فَإِذَا سَوَّيْتُهُ وَنَفَخْتُ فِيهِ مِنْ رُوحِي فَقَعُوا لَهُ سَاجِدِينَ ۝٢٩﴾ (الحجر)

«And [mention, O Muhammad], when your Lord said to the angels, “I will create a human being out of clay from an altered black mud (28) And when I have proportioned him and breathed into him of My [created] soul, then fall down to him in prostration.” (29) » (Al-Hijr).

The concepts of the “soul” and the “self” are central to the theory of social systems we intend to develop in the remaining sections of this chapter. Therefore, it is important to have an idea about how they are understood in the Islamic heritage. Below are some excerpts from Ibn al Qayyim’s book “*al Ruh*” which contains a comprehensive critical survey of what Muslim scholars of the past had to say about the concept of the soul in addition to his own judgements.

3.2.1 - The “Soul” in the Classical Islamic Scholarship

Ibn al Qayyim asks and explores answers to the following questions:

“Is the soul eternal or engendered and created? And if it is engendered and created and yet of the affair of Allah (SWT) how could it be that the affair of Allah (SWT) is engendered and created? And Allah (SWT) said He breathed into Adam from His soul, so is this addition of the soul to Him an indication that it is eternal or not? What is the truth about this addition? Allah told He created Adam by His own hand and breathed into him from His soul, so he added the hand and the soul to him in the same manner”.

After critically considering the various points of view of Muslim scholars on the above questions Ibn al Qayyim gave more credibility to the following answers, starting with the verse of the breathing of the soul:

“It should be known that additions to Allah (SWT) are of two types:

1- Attributes that do not stand on their own e.g., knowledge, competence, speech, talk, hearing, seeing etc., which is ascribing an attribute to the entity that has it. Thus Allah’s knowledge, speech, will, competence, and His life are intrinsic to Him and not created. So are His face and hand.

2- The addition of independent entities like house, camel, servant, prophet and soul: This is an addition of a creature to its creator and a manufacture to its manufac-

turer; however, it is an addition that requires special consideration and honor that distinguishes the added from other entities, e.g., the "house of Allah" although all the houses are His. Also, the "camel of Allah" though all camels are His creatures but the addition here is to Him as a Deity that requires His love and honor to his added creature in contradistinction with the general addition to Him as Lord that requires mere creation and existence.

Thus, the addition of the "soul" to Allah (SWT) belongs to this type of special additions and not to the general one nor to the like of adding attributes to Him".

About the creation of the soul, Ibn al Qayyim concludes:

"There is no disagreement between Muslims that the souls in Adam and his progeny and in Jesus and in other human beings are all created by Allah (SWT). He invented, created and added them to Him just as He added His other creatures to Him. Ibn Taymiyyah said: The soul of the human being is an invented creature. There is a consensus about this between the Ulama of the past and all the Muslim Ummah.

This "soul" that is held in hand is but the "self" that is taken by Allah (SWT) in its death and in its sleep and taken by the Angel of death. It is but the "self" that the Angel, who sits near the head of a person, brings it out of his body forcibly...It is but the "self" that believes and disbelieves, obeys and disobeys, enjoins evil, blames and become tranquil. It is but the "self" that will be tortured and pleased, becomes happy and sad...etc. All these are the characteristics of an invented and created being under complete control and will of its Creator".

In problem number 18 Ibn al Qayyim asked the following question: Which had been created first, the souls or the bodies? After considering the various points of view of Muslim scholars he concluded that the bodies were first in creation because: "Adam, the father of all humans, had been created thus. Allah (SWT) sent the Angel Gabriel who took a fistful of sand from earth, then fermented it until it became a clay, then formed him and breathed into him the soul. When the soul entered the body, it became flesh and blood, alive and talking. Thus, the Holy Qur'an, Sunnah and tradition confirm that Allah (SWT) breathed into Adam from His soul after He formed his body and from that breath the soul came into him".

The conclusion we get from the above texts of Ibn al Qayyim is that the *human*

soul is a created entity and identical with the *human self*. With this in mind, we move to consider these two ontological concepts within the systemic Qur`anic worldview and its derived general social systems from the perspective of systemism.

3.2.2 - The Concept of the “Soul” in the Systemic Framework of QWV

In the last chapter, where the author developed the systemic QWV, a systemic model of the soul system has been proposed, so there is no need to elaborate it here. However, the following can be deduced from that model.

The soul is a complex spiritual system that emerged from the intense interaction of its component parts which are the created divine attributes designed by Allah (SWT) for man as vicegerent on earth. The attracter of the soul system within which these created divine attributes are arranged is *Iman*, itself a state space where the attributes are ideally organized. We understand from the story of the creation of man as narrated by the Holy Qur`an that when this soul was first breathed into the created human body its potential properties were activated. As a result of the soul-body interaction a new entity called by the Holy Qur`an “Self” emerged ushering in the emergence of a new entity called *man* (*Insan*) with properties that put him apart from all the other creatures of Allah. Had it not been for the material thickness of the body, the dominance of its lusts over the property system of the self and the wrong doings by man resulting from such dominance, man could do miracles in the world by putting into practice the causal powers of his relative share from these created divine attributes. This is simply because of the enhancement these attributes will get from their original source, the absolute and infinite divine attributes of Allah (SWT), as the following authentic prophetic sayings tell us:

وعن أبي ربي حنظلة بن الربيع الأسيدي الكاتب أحد كتاب رسول الله صلى الله عليه وسلم قال: لقيني أبو بكر رضي الله عنه فقال: كيف أنت يا حنظلة؟ قلت: نافق حنظلة؟ قلت: نافق حنظلة (قال: سبحان الله ما تقول؟) قلت: نكون عند رسول الله صلى الله عليه وسلم يذكرنا بالجنة والنار كأننا رأي عين، فإذا خرجنا من عند رسول الله صلى الله عليه وسلم عافسنا الأزواج والأولاد والضييعات نسينا كثيراً. قال أبو بكر رضي الله عنه: فوالله إنا لتلقى مثل هذا، فانطلقت أنا وأبو بكر حتى دخلنا على رسول الله صلى الله عليه وسلم. فقلت: نافق حنظلة يا رسول الله (فقال رسول الله صلى الله عليه وسلم: «وما ذاك؟» قلت: يا رسول الله نكون عندك تذكرنا بالنار والجنة كأننا رأي العين، فإذا خرجنا من عندك عافسنا الأزواج والأولاد والضييعات نسينا كثيراً. فقال رسول الله، صلى الله عليه وسلم: «والذي نفسي بيده لو تدومون على ما تكونون عندي وفي الذكر لصافحتكم الملائكة على فرشكم وفي طرقكم، ولكن يا حنظلة ساعة وساعة» ثلاث مرات، (رواه مسلم).

Hanzalah Al-Usayyidi (May Allah be pleased with him) who was one of the scribes of Messenger of Allah (ﷺ), reported:

I met Abu Bakr (may Allah be pleased with him) and he said: "How are you O Hanzalah?" I said, "Hanzalah has become a hypocrite". He said, "Far removed is Allah from every imperfection, what are you saying?" I said, "When we are in the company of Messenger of Allah (ﷺ) and he reminds us of Hell-fire and Jannah, we feel as if we are seeing them with our very eyes, and when we are away from Messenger of Allah (ﷺ), we attend to our wives, our children, our business, most of these things (pertaining to life hereafter) slip out of our minds." Abu Bakr (may Allah be pleased with him) said, "By Allah, I also experience the same thing". So, Abu Bakr (may Allah be pleased with him) and I went to Messenger of Allah (ﷺ), and I said to him, "O Messenger of Allah (ﷺ), Hanzalah has turned hypocrite." Thereupon Messenger of Allah (ﷺ) said, "What has happened to you?" I said, "O Messenger of Allah, when we are in your company, and are reminded of Hell-fire and Jannah, we feel as if we are seeing them with our own eyes, but when we go away from you and attend to our wives, children and business, much of these things go out of our minds." Thereupon Messenger of Allah (ﷺ) said, "By Him in Whose Hand is my life if your state of mind remains the same as it is in my presence and you are always busy in remembrance (of Allah), the angels will shake hands with you in your beds and in your roads; but Hanzalah, time should be devoted (to the worldly affairs) and time should be devoted (to prayer)". He (the Prophet (ﷺ)) said this thrice. [Muslim].

عن أبي هريرة رضي الله عنه قال: قال رسول الله، صلى الله عليه وسلم: «إِنَّ اللَّهَ قَالَ: مَنْ عَادَى لِي وَلِيًّا فَقَدْ آذَنْتُهُ بِالْحَرْبِ، وَمَا تَقَرَّبَ إِلَيَّ عَبْدِي بِشَيْءٍ أَحَبَّ إِلَيَّ مِمَّا افْتَرَضْتُ عَلَيْهِ، وَمَا يَزَالُ عَبْدِي يَتَقَرَّبُ إِلَيَّ بِالنَّوَافِلِ حَتَّىٰ أَحْبَبْتُهُ، فَإِذَا أَحْبَبْتُهُ: كُنْتُ سَمْعَهُ الَّذِي يَسْمَعُ بِهِ، وَبَصَرَهُ الَّذِي يُبْصِرُ بِهِ، وَيَدَهُ الَّتِي يَبْطِشُ بِهَا، وَرِجْلَهُ الَّتِي يَمْشِي بِهَا، وَإِن سَأَلَنِي لِأَعْطَيْتُهُ، وَلَئِن أَسْتَعَاذَنِي لِأُعِيذَنَّهُ، وَمَا تَرَدَّدْتُ عَنْ شَيْءٍ أَنَا فَاعِلُهُ تَرَدُّدِي عَنْ نَفْسِ الْمُؤْمِنِ، يَكْرَهُ الْمَوْتَ وَأَنَا أَكْرَهُ مَسَاءَتَهُ» [صحيح] - [رواه البخاري]

Abu Hurayrah (may Allah be pleased with him) reported that the Prophet (may Allah's peace and blessings be upon him) said: "Verily Allah said: 'Whoever shows enmity to a pious worshiper of Mine, I declare war against him. My slave does not draw near to Me with anything dearer to Me than what I have made obligatory for him. My slave continues to draw near to Me by doing supererogatory deeds until I love him. When I love him, I become his hearing with which he hears, his sight with which he sees, his hand with which he strikes, and his foot with which he walks. Were he to ask Me for something, I would surely give it to him, and were he to seek refuge with Me, I would surely grant him refuge. I do not hesitate to do anything as I hesitate to take the soul of the believer, for he hates death, and I hate to hurt him.'" [Al-Bukhari]

The soul is an indestructible and incorruptible system of created divine attributes and because these attributes have no efficacy until they combine with a concrete entity Allah (SWT) offered the skies, earth and mountains to bear them as a trust and be accountable for the way they use them, but they declined to bear it and feared it. It is man who undertook to bear the trust of the soul system because his body is uniquely designed to bear such a heavy load. However, man proved to be unjust and ignorant in doing so, as the Holy Qur`an tells us:

﴿ إِنَّا عَرَضْنَا الْأَمَانَةَ عَلَى السَّمَوَاتِ وَالْأَرْضِ وَالْجِبَالِ فَأَبَيْنَ أَنْ يَحْمِلْنَهَا وَأَشْفَقْنَ مِنْهَا وَحَمَلَهَا الْإِنْسَانُ إِنَّهُ كَانَ ظَلُومًا جَهُولًا ۝٧٢﴾ (الأحزاب)

«Indeed, we offered the Trust to the heavens and the earth and the mountains, and they declined to bear it and feared it; but man [undertook to] bear it. Indeed, he was unjust and ignorant (72) ». (Al-Ahzab).

Man has been *unjust* to himself because he has not put the huge potential of the soul system to good utility on earth and its resources for which he has been appointed as vicegerent. On the contrary, corruption has been the trademark of mankind on earth which is why he deserved to be called *ignorant* because he has been oblivious to the catastrophic consequences of his corruption on earth.

The soul system as defined above and in the previous chapter is one and the same for every human being because it is the source of their honor and preference over other creatures. The study of the soul system should follow the approach described by systemism, i.e., in terms of its components which are the created divine attributes in their relative human dimension; in terms of its structure which is the attractor *Iman*; in terms of its internal environment represented by the individual in his totality and its external environment represented by the social and natural systems; in terms of the processes (mechanisms) of purification (*tazkiyah*) that should be followed to promote each divine attribute, e.g. mercy, knowledge, patience, justice, power, competence, creativity, etc., in the human self.

3.3 - The Emergence of the Human "Self" in the QWV

3.3.1 - The Concept of the Self in Classical Islamic Scholarship

In the problem no.19 in his book "*al Ruh*" Ibn al Qayyim asked the following questions:

What is the truth about the "self"? Is it one of the parts of the body, or one of its transient states, or an associated body breathed into it, or a pure essence? Is it the soul, or something different? Is the enjoiner of evil, the blamer and the tranquil one and the same self with these characteristics or they are three selves?

Ibn al Qayyim favored the following definition of the self:

"It is an entity that is different in essence from the human body. It is a luminous, celestial, light, live and moving body that penetrates the essence of organs and pervades them just as water pervades roses, oil pervades olive and fire pervades coal. As long as these organs are good to receive the influences that come to it from this fine body, it remains intertwined with these organs and gives them their abilities of perception and voluntary movements. However, if these organs become corrupt such that they no longer accept these influences the soul leaves the body and joins the world of souls."

Ibn al Qayyim commented on this definition of the *self* as the only appropriate definition and all other definitions are null and void. It has evidence from Revelation and the consensus of the Companions of the Prophet, *peace be upon them*, as well as from mind and nature.

In problem no. 20 of his book, *al Ruh*, Ib al Qayyim asks the following question: *Is the "self" and the "soul" an identical thing or they are different things?*

After considering the opinions of various Muslim scholars, he concludes: The *self* in the Holy Qur`an could mean the human entity in its totality as in the following verses:

﴿...فَإِذَا دَخَلْتُمْ بُيُوتًا فَسَلِّمُوا عَلَىٰ أَنفُسِكُمْ تَحِيَّةً مِّنْ عِنْدِ اللَّهِ مُبْرَكَةٌ طَيِّبَةٌ...﴾ (النور) ﴿٦١﴾

« But when you enter houses, give greetings of peace upon each other - a greeting from Allah, blessed and good. (61) » (Al-Nur);

﴿...وَلَا تَقْتُلُوا أَنفُسَكُمْ...﴾ (النساء) ﴿٢٩﴾

«...And do not kill yourselves (or one another)...(29)» (An-Nisaa);

﴿يَوْمَ تَأْتِي كُلُّ نَفْسٍ تُجَادِلُ عَن نَّفْسِهَا وَتُوَفَّىٰ كُلُّ نَفْسٍ مَّا عَمِلَتْ وَهُمْ لَا يُظْلَمُونَ﴾ (النحل) ﴿١١١﴾

«On the Day when every soul will come disputing for itself, and every soul will be fully compensated for what it did, and they will not be wronged (111)» (An_Nahl);

﴿كُلُّ نَفْسٍ بِمَا كَسَبَتْ رَهِيئَةٌ﴾ (المدرثر) ﴿٣٨﴾

«Every soul, for what it has earned, will be retained (38)» (Al-Muddathir).

The *self*, in the holy Qur`an, could also refer to the *soul* alone as in the following verses:

﴿يَا أَيُّهَا النَّفْسُ الْمَطْمَئِنَّةُ﴾ (الفجر) ﴿٢٧﴾

«[To the righteous it will be said], «O reassured soul (27)» (Al-Fajr);

﴿... أَخْرِجُوا أَنفُسَكُمْ...﴾ (الأنعام) ﴿٩٣﴾

« ...»Discharge your souls! « ...»(93)» (Al-An'am);

﴿وَأَمَّا مَنْ خَافَ مَقَامَ رَبِّهِ - وَتَنَىٰ النَّفْسَ عَنِ الْهَوَىٰ .﴾ (النازعات) ﴿٤٠﴾

«But as for he who feared the position of his Lord and prevented the soul from [unlawful] inclination (40)» (An-Nazi'at);

﴿وَمَا أُبْرِئُ نَفْسِي إِنْ لَّمْ أَرَاكَ بِالسُّوءِ إِلَّا مَا رَجِمَ رَبِّي إِنْ رَبِّي غَفُورٌ رَّحِيمٌ﴾ (يوسف) ﴿٥٣﴾

«And I do not acquit myself. Indeed, the soul is a persistent enjoiner of evil, except those upon which my Lord has mercy. Indeed, my Lord is Forgiving and Merciful.»(53)» (Yusuf)

According to Ibn al Qayyim the soul cannot be taken to represent the body, neither on its own nor with the self. One of the Arabic connotations of self (نفس) is something valuable (نفيس), the other is breathing (تنفس) because of the frequency with which the self leaves and re-enters the body. Whenever the person sleeps his self leaves him, and when he wakes up it returns to him. When he dies it leaves his body completely and when he is buried it returns to him and when his questioning is over it leaves him again and when he is resurrected it comes back to him. Thus, the difference between the *self* and the *soul* is one of properties not of essence. *Blood* is called *self* because it is through its spilling out of the body that leads to death and is accompanied by the self-coming out of the body. There is no life without blood just as there is no life without the self.

In problem no. 21 Ibn al Qayyim asked the following question: Is there just one *self* or three?

He raised the question because, as he explains, many people think that there are three selves; *tranquil* (مطمئنة); *blaming* (لؤامة) and *enjoiner of evil* (مارة) based on the following verses:

﴿يَا أَيُّهَا النَّفْسُ الْمَطْمَئِنَّةُ ۚ ۲۷﴾ (الفجر)

« [To the righteous it will be said], “O reassured soul(27) [» (Al-Fajr);

﴿لَا أَقْسِمُ بِيَوْمِ الْقِيَامَةِ ۙ وَلَا أَقْسِمُ بِالنَّفْسِ اللَّوَّامَةِ ۚ ۲﴾ (القيامة)

«I swear by the Day of Resurrection (1) And I swear by the reproaching soul [to the certainty of resurrection] (2)» (Al-Qiyamat)

﴿وَمَا أُبْرِئُ نَفْسِي ۚ إِنَّ النَّفْسَ لَكُمَّارَةٌ بِالسُّوءِ ۗ إِلَّا مَا رَحِمَ رَبِّي ۚ إِنَّ رَبِّي غَفُورٌ رَحِيمٌ ۝ ۵۳﴾ (يوسف)

«And I do not acquit myself. Indeed, the soul is a persistent enjoiner of evil, except those upon which my Lord has mercy. Indeed, my Lord is Forgiving and Merciful.»(53)» (Yusuf)

Ibn al Qayyim ascertains that there is only one self with these three states and is called after the dominant state; it is the tranquil self when dominated by tranquility and blaming self when dominated by reproach and enjoiner

of evil when dominated by this state. The tranquil self is one that feels content with its worship and love of Allah (SWT) and its complete reliance on Him. The blaming self is of two types; the first is the one that is blaming and being blamed at the same time by Allah (SWT) and the Angels because of its ignorance and injustice. The other type is the one that is blaming but not being blamed, for it continuously blames its owner for not doing enough in obeying and serving Allah (SWT), though exerting maximum efforts. Such a self cannot be blamed. The noblest self is the one that blames itself for not doing enough to please Allah (SWT) though exerting maximum efforts and at the same time tolerates the reproach of others for His sake. Such a self has put behind it the reproach of its Creator. On the other hand, the self that feels content with whatever it is doing and does not blame itself for it, nor bear for the sake of Allah (SWT) the reproach of others it will be the one that Allah (SWT) blame.

The self that enjoins evil is the one that has Satan as its companion who promises it and awakens its desire for evil and shows it falsehood in an acceptable manner and supplies it with all sorts of false promises and destructive desires. The devil gets help from the very whims and will of the self that enjoins evil and from such whims that all sorts of evil find their way to it. There is no more powerful enemy to the self than its own whims and will.

3.3.2- The Concept of the Self in the General Social Systems Theory of QWV

The third stage in the emergence of man is that of the *self* which emerges from the interaction between the body system and the soul system that brings the created divine causal powers (properties) to it. The self in the Holy Qur`an is not equivalent to the soul. When Allah (SWT) mentioned the soul which he breathed into the body he did not reveal anything about its essence or creation. It is Muslim scholars who, *ex post*, tried to answer these questions by observing social phenomena and the way human beings behave in mundane life. On the contrary, the Holy Qur`an has a lot to say about the self in terms of its properties, states and dynamics in real life situations, in sleep and in death, and will be held accountable for what it does in this earthly life on the Day of Judgement. The self in the Holy Qur`an is the essence of the human being as the following verses amply demonstrate, though their English translations use the word *soul* (روح) or the Arabic word *self* (نفس) giving the impression that they are synonymous, but they are not.

﴿ وَنَفْسٍ وَمَا سَوَّاهَا ﴾ ﴿ ٧ ﴾ ﴿ فَأَلْهَمَهَا فُجُورَهَا وَتَقْوَاهَا ﴾ ﴿ ٨ ﴾ (الشمس)

«And [by] the soul and He who proportioned it (7) And inspired it [with discernment of] its wickedness and its righteousness (8)» (Ash-Shams);

﴿ وَمَا أُبْرِئُ نَفْسِي إِنَّ النَّفْسَ لَكُمَارَةٌ بِالسُّوءِ إِلَّا مَا رَحِمَ رَبِّي إِنَّ رَبِّي غَفُورٌ رَحِيمٌ ﴾ ﴿ ٥٣ ﴾ (يوسف)

«And I do not acquit myself. Indeed, the soul is a persistent enjoiner of evil, except those upon which my Lord has mercy. Indeed, my Lord is Forgiving and Merciful.» (53)» (Yusuf);

﴿ إِنَّ اللَّهَ عِنْدَهُ عِلْمُ السَّاعَةِ وَيُنزِلُ الْغَيْثَ وَيَعْلَمُ مَا فِي الْأَرْحَامِ وَمَا تَدْرِي نَفْسٌ مَّاذَا تَكْسِبُ غَدًا وَمَا تَدْرِي نَفْسٌ بِأَيِّ أَرْضٍ تَمُوتُ إِنَّ اللَّهَ عَلِيمٌ خَبِيرٌ ﴾ ﴿ ٣٤ ﴾ (لقمان)

«Indeed, Allah [alone] has knowledge of the Hour and sends down the rain and knows what is in the wombs. And no soul perceives what it will earn tomorrow, and no soul perceives in what land it will die. Indeed, Allah is Knowing and Acquainted (34)» (Luqman);

﴿ اللَّهُ يَتَوَفَّى الْأَنفُسَ حِينَ مَوْتِهَا وَالَّتِي لَمْ تَمُتْ فِي مَنَامِهَا فَيُمْسِكُ الَّتِي قَضَىٰ عَلَيْهَا الْمَوْتَ وَيُرْسِلُ الْأُخْرَىٰ إِلَىٰ أَجَلٍ مُّسَمًّى إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴾ ﴿ ٤٢ ﴾ (الزمر)

«Allah takes the souls at the time of their death, and those that do not die [He takes] during their sleep. Then He keeps those for which He has decreed death and releases the others for a specified term. Indeed in that are signs for a people who give thought (42)» (Az-Zumar);

﴿...وَلَوْ تَرَىٰ إِذِ الظَّالِمُونَ فِي غَمْرَاتِ الْمَوْتِ وَالْمَلَائِكَةُ بَاسِطُو أَيْدِيهِمْ أَخْرَجُوا أَنفُسَكُمْ أَيُّكُمْ تُجَزَوْنَ عَذَابِ الْهُونِ بِمَا كُنتُمْ تَقُولُونَ عَلَى اللَّهِ غَيْرَ الْحَقِّ وَكُنتُمْ عَنْ ءَايَاتِهِ - تَسْتَكْبِرُونَ ﴾ ﴿ ٩٣ ﴾ (الأنعام)

«... And if you could but see when the wrongdoers are in the overwhelming pangs of death while the angels extend their hands, [saying], “Discharge your souls! Today you will be awarded the punishment of [extreme] humiliation for what you used to say against Allah other than the truth and [that] you were, toward His verses, being arrogant.” (93)» (Al-An'am);

﴿ كُلُّ نَفْسٍ بِمَا كَسَبَتْ رَهينَةٌ ﴾ ﴿ ٣٨ ﴾ (المدثر)

«Every soul, for what it has earned, will be retained (38)» (Al-Muddathth)

In the Holy Qur'an, when Allah (SWT) discussed the phases of human creation, the *self* was not accorded a separate stage of creation as the body was. He mentioned just two stages, the first concerns the creation of the body, the second when He breathed of His soul into this created body, as the following verses tell us:

﴿وَإِذْ قَالَ رَبُّكَ لِلْمَلَائِكَةِ إِنِّي خَلِيقٌ بَشَرًا مِّنْ صَلْصَلٍ مِّنْ حَمَإٍ مَّسْنُونٍ ٨٢ فَإِذَا سَوَّيْتُهُ وَنَفَخْتُ فِيهِ مِن رُّوحِي فَقَعُوا لَهُ سَاجِدِينَ ٢٩﴾ (الحجر)

«And [mention, O Muhammad], when your Lord said to the angels, «I will create a human being out of clay from an altered black mud (28) And when I have proportioned him and breathed into him of My [created] soul, then fall down to him in prostration.» (29)» (Al-Hijr);

﴿إِذْ قَالَ رَبُّكَ لِلْمَلَائِكَةِ إِنِّي خَلِيقٌ بَشَرًا مِّن طِينٍ ١٧ فَإِذَا سَوَّيْتُهُ وَنَفَخْتُ فِيهِ مِن رُّوحِي فَقَعُوا لَهُ سَاجِدِينَ ٧٢ فَسَجَدَ الْمَلَائِكَةُ كُلُّهُمْ أَجْمَعُونَ ٧٣﴾ (ص)

«[So mention] when your Lord said to the angels, «Indeed, I am going to create a human being from clay(71) So when I have proportioned him and breathed into him of My [created] soul, then fall down to him in prostration.»(72) So the angels prostrated - all of them entirely(73)» (Sad)

Thus, I deduce that the *self* has emerged and proportioned during these two stages, either during the first stage when the body was created and in this case the self is part of it, or during the second stage after the breathing of the soul into the body and in this case the *self* has emerged from the interaction and the combination of the body and the soul. Here I am invoking the ontological and systemic meaning of the concept of emergence introduced in early chapters. The evidence is in favor of the second proposition for two reasons, firstly; as I mentioned above and as Ibn al Qayyim described, the self has properties that are completely different from those of the body. Secondly, in the Holy Qur'an Jesus, *peace and blessings be upon him*, became body and self after the soul was breathed into the virgin Mary, *peace be upon her*:

﴿وَمَرْيَمَ ابْنَتَ عِمْرَانَ الَّتِي أَحْصَانَتْ فَرْجَهَا فَنفَخْنَا فِيهِ مِن رُّوحِنَا وَصَدَقَتْ بِكَلِمَاتِ رَبِّهَا وَكُتِبَ عَلَيْهَا - وَكَانَتْ مِنَ الْمُقَاتِلِينَ ١٢﴾ (التحريم)

«And [the example of] Mary, the daughter of Imran, who guarded her chastity, so We blew into [her garment] through Our angel, and she believed in the words of her Lord and His scriptures and was of the devoutly obedient(12)» (At-Tahrim);

﴿وَالَّذِي أَحْصَيْنَتْ فَرْجَهَا فَتَنَفَخْنَا فِيهَا مِنْ رُوحِنَا وَجَعَلْنَاهَا آيَةً لِلْعَالَمِينَ ٩١﴾ (الأنبياء)

«And [mention] the one who guarded her chastity, so We blew into her [garment] through Our angel [Gabriel], and We made her and her son a sign for the worlds (91)» (Al-Anbiyaa)

The emerging self is a concrete living system composed of some elements of the body and sustained by their combination and continuous interaction. The self has acquired properties from these material elements, beside emergent properties from the soul system. Thus, the Self as a system has its own novel dual causal powers that neither of its components has. Emergent properties, which reflect a unique configuration of organizational relations between the components of a system, are what distinguish any new system from other existing systems and mark its distinct effects in the world. With respect to the human self, these novel emergent properties reflect the integration of its material and soul systems in what the Holy Qur'an describes as its *wickedness* and its *righteousness*:

﴿وَنَفْسٍ وَمَا سَوَّاهَا ٧﴾ ﴿فَأَلَّهَمَّهَا فُجُورَهَا وَتَقْوَاهَا ٨﴾ (الشمس)

«And [by] the soul and He who proportioned it (7) And inspired it [with discernment of] its wickedness and its righteousness (8)» (Ash-Shams)

The emergent wicked properties of the self are indicative of the effects of the material body, as the Holy Qur'an tells us, e.g., weakness, hastiness, anxiousness, impatience, withholding, miserliness...etc.

﴿إِنَّ الْإِنْسَانَ خُلِقَ هَلُوعًا ١٩﴾ ﴿إِذَا مَسَّهُ الشَّرُّ جَزُوعًا ٢٠﴾ ﴿وَإِذَا مَسَّهُ الْخَيْرٌ مَنُوعًا ٢١﴾ (المعارج)

«Indeed, mankind was created anxious:(19) When evil touches him, impatient (20) And when good touches him, withholding [of it] (21)» (Al-Ma'arij)

﴿خُلِقَ الْإِنْسَانُ مِنْ عَجَلٍ سَأُورِيكُمْ آيَاتِي فَلَا تَسْتَعْجِلُونِ ٣٧﴾ (الأنبياء)

« *Man was created of haste. I will show you My signs, so do not impatiently urge Me (37)* » (Al-Anbiyaa).

Some of the states of piety of the self and their implied emergent properties which are indicative of the effects of the *soul system* are described by the following verses:

﴿التَّائِبُونَ الْعَابِدُونَ الْحَامِدُونَ السَّاجِدُونَ الْآمُرُونَ بِالْمَعْرُوفِ وَالنَّاهُونَ عَنِ الْمُنْكَرِ وَالْحَفِظُونَ لِحُدُودِ اللَّهِ وَبَشِّرِ الْمُؤْمِنِينَ ١١٢﴾ (التوبة)

«[Such believers are] the repentant, the worshippers, the praisers [of Allah], the travelers [for His cause], those who bow and prostrate [in prayer], those who enjoin what is right and forbid what is wrong, and those who observe the limits [set by] Allah. And give good tidings to the believers (112)» (At-Tauba).

﴿قَدْ أَفْلَحَ الْمُؤْمِنُونَ ١﴾ ﴿الَّذِينَ هُمْ فِي صَلَاتِهِمْ خُسَعُونَ ٢﴾ ﴿وَالَّذِينَ هُمْ عَنِ اللَّغْوِ مُعْرِضُونَ ٣﴾ ﴿وَالَّذِينَ هُمْ لِلزَّكَاةِ فَاعِلُونَ ٤﴾ ﴿وَالَّذِينَ هُمْ لِفُرُوجِهِمْ حَافِظُونَ ٥﴾ ﴿إِلَّا عَلَىٰ أَزْوَاجِهِمْ أَوْ مَا مَلَكَتْ أَيْمَانُهُمْ فَإِنَّهُمْ غَيْرُ مَلُومِينَ ٦﴾ ﴿فَمَنْ ابْتَغَىٰ وَرَاءَ ذَلِكَ فَأُولَٰئِكَ هُمُ الْعَادُونَ ٧﴾ ﴿وَالَّذِينَ هُمْ لِأَمْتِنِهِمْ وَعَهْدِهِمْ رَاعُونَ ٨﴾ ﴿وَالَّذِينَ هُمْ عَلَىٰ صَلَوَاتِهِمْ يُحَافِظُونَ ٩﴾ (المؤمنون)

« *Certainly will the believers have succeeded:(1) They who are during their prayer humbly submissive(2) And they who turn away from ill speech(3) And they who are observant of zakah(4) And they who guard their private parts(5) Except from their wives or those their right hands possess, for indeed, they will not be blamed(6) But whoever seeks beyond that, then those are the transgressors(7) And they who are to their trusts and their promises attentive(8) And they who carefully maintain their prayers(9)*» (Al-Muminun).

Some of these descriptions can be classified as states, some as properties and some as actions and events. Rapid alterations in an entity's state could be characterized as an event, while extended alterations could be considered states, and lingering states evolve into properties, as suggested by Bunge. The oscillation of the manifest properties and states of the self in its worldly affairs between transgression and piety, reflecting its dispositional constitution, is a consequence of the oscillation of the human actions and interactions between the attractor *Iman* and its basin and the opposite attractor *Kufr* and its basin¹³. The fact that the human self is a system of dual properties, some material and

13- The book of Madarij al Salikeen by Ibn al Qayyim is a rich Islamic perspective of the dynamics of these states of the human self.

some spiritual, points to the concreteness of the self, as this relevant part of the authentic Hadith vindicates:

وَعَنِ الْبَرَاءِ بْنِ عَازِبٍ قَالَ: خَرَجْنَا مَعَ النَّبِيِّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ فِي جَنَازَةِ رَجُلٍ مِنَ الْأَنْصَارِ فَأَنْهَيْتُنَا إِلَى الْقَبْرِ فَلَمَّا يَلْحَدُ فَجَلَسَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ وَجَدَسْنَا حَوْلَهُ كَأَنَّهُ عَلَى رُؤُوسِنَا الطَّيْرَ وَفِي يَدِهِ عُودٌ يُنْكُثُ بِهِ فِي الْأَرْضِ فَرَفَعَ رَأْسَهُ فَقَالَ: «اسْتَعِيدُوا بِاللَّهِ مِنْ عَذَابِ الْقَبْرِ» مَرَّتَيْنِ أَوْ ثَلَاثًا ثُمَّ قَالَ: «إِنَّ الْعَبْدَ الْمُؤْمِنَ إِذَا كَانَ فِي انْقِطَاعٍ مِنَ الدُّنْيَا وَأَقْبَالَ مِنَ الْآخِرَةِ نَزَلَ إِلَيْهِ مِنَ السَّمَاءِ مَلَائِكَةٌ بِيضُ الْوُجُوهِ كَأَنَّ وُجُوهُهُمُ الشَّمْسُ مَعَهُمْ كَفَنٌ مِنْ أَكْفَانِ الْجَنَّةِ وَحَنُوطٌ مِنْ حَنُوطِ الْجَنَّةِ حَتَّى يَجْلِسُوا مِنْهُ مَدَّ الْبَصَرِ ثُمَّ يَجِيءُ مَلَكُ الْمَوْتِ حَتَّى يَجْلِسَ عِنْدَ رَأْسِهِ فَيَقُولُ: أَيُّهَا النَّفْسُ الطَّيِّبَةُ اخْرُجِي إِلَى مَغْفِرَةٍ مِنَ اللَّهِ وَرِضْوَانٍ» قَالَ: «فَتَخْرُجُ تَسِيلٌ كَمَا تَسِيلُ الْقَطْرَةُ مِنَ فِي السَّقَاءِ فَيَأْخُذُهَا فَإِذَا أَخَذَهَا لَمْ يَدْعُوهَا فِي يَدِهِ طَرْفَةَ عَيْنٍ حَتَّى يَأْخُذُوهَا فَيَجْعَلُوهَا فِي ذَلِكَ الْكَفَنِ وَفِي ذَلِكَ الْحَنُوطِ وَيَخْرُجُ مِنْهَا كَأَطْيَبِ نَفْحَةٍ مَسْكٍ وَجِدَتْ عَلَى وَجْهِ الْأَرْضِ»..... رواه أحمد (صحيح الألباني).

Al-Bara' b. 'Azib said:

“We went out with the Prophet to the funeral of a man of the Ansar and came to the grave. It had not yet been dug, so God’s messenger sat down and we sat down around him quietly. He had in his hand a stick with which he was making marks on the ground. Then he raised his head and said, “Seek refuge in God from the punishment of the grave” saying it twice or thrice. He then said, “When a believer is about to leave the world and go forward to the next world, angels with faces white as the sun come down to him from heaven with one of the shrouds of paradise and some of the perfume of paradise and sit away from him as far as the eye can see. Then the angel of death comes and sits at his head and says, ‘Good soul, come out to forgiveness and acceptance from God.’ It then comes out as a drop flows from a water-skin and he seizes it; and when he does so, they do not leave it in his hand for an instant, but take it and place it in that shroud and that perfume, and from it there comes forth a fragrance like that of the sweetest musk found on the face of the earth.....” (Ahmad transmitted it- authenticated by Albani).

The above prophetic saying points to an existential truth about the human self, namely its material fluidity that makes it at the moment of death; *“comes out as a drop flows from a water-skin”*. Not only that but the Angels *“place it in that shroud and that perfume”* and it has a fragrance *“like that of the sweetest musk found on the face of the earth”*. Now, this material watery dimension of the self may be the effect of the body in its combination and continuous interaction with the soul from which the self emerged. Let us remember that the Holy Qur`an tells us that Allah (SWT) created every living thing from water, including man:

﴿وَاللَّهُ خَلَقَ كُلَّ دَابَّةٍ مِنْ مَاءٍ فَمِنْهُمْ مَنْ يَمْشِي عَلَى بَطْنِهِ - وَمِنْهُمْ مَنْ يَمْشِي عَلَى رِجْلَيْنِ وَمِنْهُمْ مَنْ يَمْشِي عَلَى أَرْبَعٍ يَخْلُقُ اللَّهُ مَا يَشَاءُ إِنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ ٤٥﴾ (النور)

«Allah has created every [living] creature from water. And of them are those that move on their bellies, and of them are those that walk on two legs, and of them are those that walk on four. Allah creates what He wills. Indeed, Allah is over all things competent (45)» (An-Nur);

﴿وَهُوَ الَّذِي خَلَقَ مِنَ الْمَاءِ بَشَرًا فَجَعَلَهُ نَسَبًا وَصِهْرًا وَكَانَ رَبُّكَ قَدِيرًا ٥٤﴾ (الفرقان)

«And it is He who has created from water a human being and made him [a relative by] lineage and marriage. And ever is your Lord competent [concerning creation] (54)» (Al-Furqan).

Water itself, according to the Holy Qur`an, is a created divine property, namely *mercy*, created in a material form that is beneficial to man and to other creatures. Therefore, water has a strong affinity to the spiritual divine properties that constitute the soul system and has emergent causal powers (properties) that are conducive to the existential material nature of the self. Water can be fluid, solid or take the form of a vapor that cannot be seen with the naked eye. It can rise to the upper strata of the atmosphere and moves with air. Water can come down as rain and run as a stream or go deep inside the earth. It pervades every element in the living body and takes the form of the thing that contains it. The upshot is that all these characteristics of water have been ascribed to the human self by Ibn al-Qayyim as we mentioned earlier. Thus, we take it as a postulate in this research that water is the component part of the human body that combines with the soul system resulting in the emergence of the human self. This leads us to another postulate, namely that the human self is an entity with dual properties generated by the dialectical interaction between the material body system and the spiritual soul system.

We propose that the *self* emerges and acts like a software installed in the human heart (mother board) located in the chest (hardware). The *self*, being the emergent result of the interaction between the soul and the body water and thus being fluid, pervades the body through the blood that runs into every vessel of it. Thus, the *self* takes the form of the particular body that contains it due to its watery characteristics. The body component of the *self* of any particular individual, together with the containment of the *self* in that

body and taking its form are what make every human *self* unique, because each body has its unique imprint such that there are no two identical bodies. These genetically inherited biological characteristics give each *self* distinct manifest properties in the domain of perception, e.g., seeing, hearing, tasting, smelling, touching, talking, thinking...etc. These inherited distinctions influence the kind of life-experiences of every *self* as it goes through the test of the allurements of this earthly life (wealth, children) and their manifestations in various forms of social actions and interactions and social systems. These life-experiences in turn determine the course of development of the *self*, oscillating between states of *transgression* and *piety*, sometimes in the attractor *Iman* and its basin, sometimes in the attractor *Kufr* and its basin and sometimes in between them.

The interaction between the soul and the body water continues throughout the life of the individual giving the *self* its turbulent agility, inside and outside the body. Inside the human heart arises the lust for worldly pleasures of “wealth” and “children”, insinuated by a seductive Satan, giving rise to like behavior. Given the properties of debauchery in the *self* it quickly falls prey to these worldly pleasures and gradually the ground state system of «*We have certainly created man in the best of stature;(4)*» (*At-Tin*), according to which every human self emerges, is corrupted and ultimately dismantled and a new *self* system dominated by the properties of debauchery emerges «*Then We return him to the lowest of the low(5)*» (*At-Tin*). The Holy Qur`an, in telling verses, summarizes these momentous developments:

﴿ قَالَ أَرَأَيْتَكَ هَذَا الَّذِي كَرَّمْتَ عَلَيَّ لَئِنِ أَخَّرْتَنِي إِلَى يَوْمِ الْفَيْئِمَةِ لَأَحْتَنِكَنَّ ذُرِّيَّتَهُ إِلَّا قَلِيلًا ۖ ٦٢ ﴾ ﴿ قَالَ أَذْهَبَ فَمَنْ تَبِعَكَ مِنْهُمْ فَإِنَّ جَهَنَّمَ جَزَاءُكُمْ جَزَاءً مُّوَفُورًا ۖ ٦٣ ﴾ ﴿ وَأَسْتَفْزِرُّ مِنْ أَشْطَطَعْتَ مِنْهُمْ بِصَوْتِكَ وَأَجْلِبَ عَلَيْهِم بِخَيْلِكَ وَرَجِلِكَ وَشَارِكِهِمْ فِي الْأَمْوَالِ وَالْأَوْلَادِ وَعِيدَهُمْ بِمَا وَعَدَهُمْ وَمَا يُعِدُّهُمْ الشَّيْطَانُ إِلَّا غُرُورًا ۖ ٦٤ ﴾ (الإسراء)

Iblees] said, «Do You see this one whom You have honored above me? If You delay] me until the Day of Resurrection, I will surely destroy his descendants, except for a Allah] said, «Go, for whoever of them follows you, indeed Hell will be the] (62)«*few And incite [to senselessness] whoever (63)recompense of you - an ample recompense you can among them with your voice and assault them with your horses and foot soldiers and become a partner in their wealth and their children and promise them.*” .(But Satan does not promise them except delusion (64)» (*Israel*

﴿ وَقَالُوا إِنِّي إِلَّا حَيَاتُنَا الدُّنْيَا وَمَا نَحْنُ بِمَبْعُوثِينَ ﴾ (الأنعام)

«And they say, «There is none but our worldly life, and we will not be resurrected.»(29) (Al-An'am);

﴿ وَقَالُوا مَا هِيَ إِلَّا حَيَاتُنَا الدُّنْيَا نَمُوتُ وَنَحْيَا وَمَا يُهْلِكُنَا إِلَّا الدَّهْرُ وَمَا لَهُم بِذَلِكَ مِنْ عِلْمٍ إِنْ هُمْ إِلَّا يَظُنُّونَ ﴾ (الجاثية)

«And they say, «There is not but our worldly life; we die and live, and nothing destroys us except time.» And they have of that no knowledge; they are only assuming (24) » (Al-Jathiyah).

Lust for worldly pleasures is an emergent property of the *self* and not an acquired property from the body because the body knows no pleasures, it only looks for the satisfaction of its biological needs in terms of food nutrients and sexual urges that preserve its survival. However, it is the satisfaction of these biological needs that work as a catalyst mechanism to make the *self* taste and discover the pleasures hidden in these goods, e.g., foods, via the complex system of the mouth, particularly the tongue, in the first stage of digestion before the food goes into the belly. Thus, start the processes (mechanisms) of the test for the *self* on the allurements of *wealth* and *children*.

However, in the heart there are also the dispositional properties of piety acquired by the *self* in its *ground state of best stature* from the soul system, e.g., seeing, hearing, *Iman*, *Ihsan*, mercy, justice, patience, knowledge, competence, creativity, power, peace, etc., and if Allah (SWT) bestowed his favor of *Iman* on any of his servants, then these dispositional properties for piety will be activated and become manifest and through the mechanisms of purification will start vying with the manifest causal powers of transgression in the *self*. Thus, the various causal powers of debauchery and piety vie against each other in the heart of the believer causing his life trajectory of development to continuously swing between the two attractors of *Iman* and *Kufr*. In this process of going through the turbulent currents of the test of worldly life the *self* experiences various states of transgressing and blaming and with the grace of Allah (SWT) its trajectory of development continues towards the *straight path* and converges on the *Iman* attractor (*ground state of best stature*). From there onwards the *self* will become the *tranquil (reassured)* self and starts a new trajectory of development following the *straight path* by empowering its endowment from the created divine properties in every walk of its mundane

life. It is a journey of personal spiritual ascendance without limit, of doing good in everyday life, thus transforming society as well to higher levels in its evolutionary trajectory.

Although the properties of the *self* that are intimately connected to *Iman* remain dormant as potentialities until they are activated by the deliberate choice of the individual to believe in Allah (SWT), which is unlikely before adulthood, we find that the acquired properties from the body, e.g., love for the pleasures of the allurements of life, become active when the *self* is in its cradle. This is because their sources, in particular food and drink, are needed as nutrients for the body even when the individual is still a fetus in the womb. That is why human cravings for worldly pleasures dominate the *self* long before the properties of piety are activated, if ever, and start to vie for effects on the *self*. Accordingly, unless the processes of piety become part of education from childhood it will be highly unlikely that they will take effect at a later age and if they do it will be an extremely arduous experience. May be this is why the inspiration of the *self* with *discernment of its wickedness* comes before that of *righteousness* in the Holy Qur`an, as the following verses tell:

﴿وَنَفْسٍ وَمَا سَوَّاهَا ۗ فَأَلْهَمَهَا فُجُورَهَا وَتَقْوَاهَا ۗ قَدْ أَفْلَحَ مَن زَكَّاهَا ۙ وَقَدْ خَابَ مَن دَسَّاهَا ۚ﴾ (الشمس)

«And [by] the soul and He who proportioned it(7) And inspired it [with discernment of] its wickedness and its righteousness(8) He has succeeded who purifies it(9) And he has failed who instills it [with corruption](10)» (Ash-Shams).

Thus, man comes out of the womb of his mother after his creation in the best stature in terms of innate capabilities to start his adventurous journey through the test of the allurements of worldly life that is awaiting him. These innate capabilities in the human *self* can be grouped into four categories: the *cognitive properties* which are concerned with the acquisition of knowledge; the *emotional properties* which are concerned with utilizing knowledge to acquire *Iman*; the *volitional properties* which are concerned with utilizing knowledge and *Iman* to develop lifetime goals and action strategies to achieve them; the *praxiological properties* which are concerned with real life practices and actions to achieve the stated goals and strategies to achieve them. May be this why Allah (SWT) in the Holy Qur`an categorized the components of the religion of Islam according to these four components of the self when He says:

﴿ هُوَ الَّذِي بَعَثَ فِي الْأُمِّيِّينَ رَسُولًا مِنْهُمْ يَتْلُوا عَلَيْهِمْ آيَاتِهِ - وَيُزَكِّيهِمْ وَيُعَلِّمُهُمُ الْكِتَابَ وَالْحِكْمَةَ وَإِنْ كَانُوا مِنْ قَبْلُ لَفِي ضَلَالٍ مُّبِينٍ ﴾ (الجمعة)

« It is He who has sent among the unlettered a Messenger from themselves reciting to them His verses and purifying them and teaching them the Book and wisdom - although they were before in clear error(2)» (Al-Jumu'a);

﴿ لَقَدْ مَنَّ اللَّهُ عَلَى الْمُؤْمِنِينَ إِذْ بَعَثَ فِيهِمْ رَسُولًا مِنْ أَنْفُسِهِمْ يَتْلُوا عَلَيْهِمْ آيَاتِهِ - وَيُزَكِّيهِمْ وَيُعَلِّمُهُمُ الْكِتَابَ وَالْحِكْمَةَ وَإِنْ كَانُوا مِنْ قَبْلُ لَفِي ضَلَالٍ مُّبِينٍ ﴾ (آل عمران)

«Certainly, did Allah confer [great] favor upon the believers when He sent among them a Messenger from themselves, reciting to them His verses and purifying them and teaching them the Book and wisdom, although they had been before in manifest error (164) » (Al-i'Imran).

We may derive the following implied propositions from the above which are, *firstly*, the necessity of developing the Islamic perspective on knowledge production along the lines of these four categories, i.e., knowledge about the Creator and his creation in the observable and unobservable worlds, including man (Master Plan of Creation-MPC); knowledge about *Iman* and the implied processes of purification of the self; knowledge about the goals and means of Islam, including technology, in this world; knowledge about the actions and practices needed to actualize these goals in real life situations. *Secondly*, the upbringing of Muslims and fashioning their education system according to the knowledge produced in the above four categories, each category of knowledge addressing the corresponding category of properties in the self as described above. The product is expected to be an integrated Muslim individual, cognitively, emotionally, volitionally and in practice.

The above rites of passage concerning the emergence of the body, the emergence of the soul and the emergence of the self usher in the last stage of the emergence of man who will be addressed by Allah SWT as (*O mankind*) and which we will elaborate in the next section:

﴿ يَا أَيُّهَا الْإِنْسَانُ مَا غَرَّبَكَ بِرَبِّكَ الْكَرِيمِ ۖ ٦ الَّذِي خَلَقَكَ فَسَوَّاكَ فَعَدَلَكَ ۗ ٧ فِي أَيِّ صُورَةٍ مَا شَاءَ رَكَّبَكَ ۗ ٨ ﴾ (الانفطار)

«O mankind, what has deceived you concerning your Lord, the Generous (6) Who created you, proportioned you, and balanced you? (7) In whatever form He willed has

He assembled you(8)» (Al-Infitar).

3.4- The Emergence of the Human Being

We mean by the emergence of the human being the human entity in its totality, a totality that every person refers to it as “I” and Allah SWT address it as “O mankind”. The essence of this totality is the “self” as we have defined above, however the individual in his totality is more than his self that has emerged from the interaction between the body and the soul. The evidence for this claim comes, first, from the holy Qur`an where man is directed to purify his self:

﴿ قَدْ أَفْلَحَ مَنْ زَكَّاهَا ۙ ﴿٩﴾ وَقَدْ خَابَ مَنْ دَسَّاهَا ۙ ﴿١٠﴾ (الشمس)

«He has succeeded who purifies it (9) And he has failed who instills it [with corruption] (10)» (Ash-Shams).

Also as in the following verses:

﴿...وَلَوْ تَرَىٰ إِذِ الظَّالِمُونَ فِي غَمْرَاتِ الْمَوْتِ وَالْمَلَائِكَةُ بَاسِطُو أَيْدِيهِمْ أَخْرَجُوا أَنفُسَكُمْ الْيَوْمَ تُجْزَوْنَ عَذَابَ الْهُونِ بِمَا كُنتُمْ تَقُولُونَ عَلَى اللَّهِ غَيْرَ الْحَقِّ وَكُنتُمْ عَنْ آيَاتِهِ تَسْتَكْبِرُونَ ۙ ﴿٩٣﴾ (الأنعام)

«...And if you could but see when the wrongdoers are in the overwhelming pangs of death while the angels extend their hands, [saying], “Discharge your souls! Today you will be awarded the punishment of [extreme] humiliation for what you used to say against Allah other than the truth and [that] you were, toward His verses, being arrogant.”(93) » (Al-An’ am).

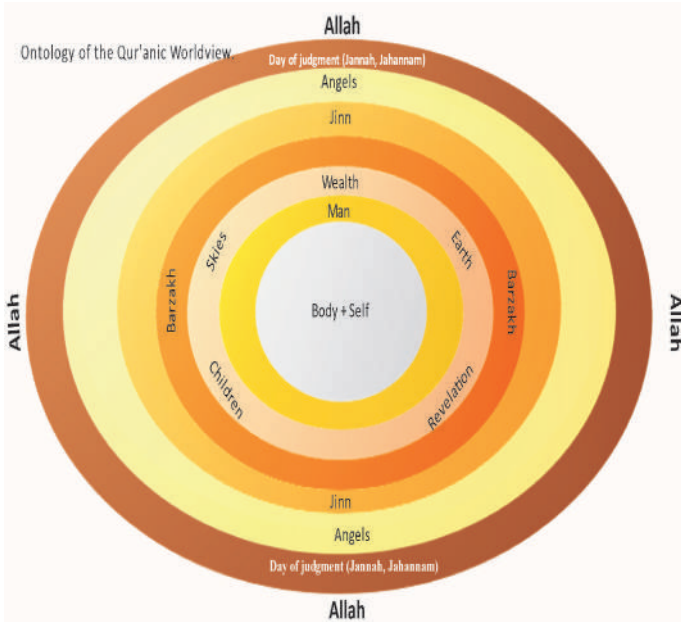
﴿ وَمَا أُبْرِئُ نَفْسِي إِنَّ النَّفْسَ لَأَمَّارَةٌ بِالسُّوءِ إِلَّا مَا رَحِمَ رَبِّي إِنَّ رَبِّي غَفُورٌ رَحِيمٌ ۙ ﴿٥٣﴾ (يوسف)

«And I do not acquit myself. Indeed, the soul is a persistent enjoiner of evil, except those upon which my Lord has mercy. Indeed, my Lord is Forgiving and Merciful.”(53) » (Yusuf)

These verses and many others imply that man in his totality is more than his self in its totality and is required to manage it and is responsible for any act resulting from obeying his self. This human being in his totality is an emergent system resulting from the interaction of its internal components of body and self and their organizational structure (endostructure) as well as their external

interaction and organizational structure (*exostructure*) with the environment. This external environment can be stratified into two main levels: the observable world (عالم الشهادة) and the unobservable world (عالم الغيب) as Fig. 7 shows.

Fig. 7: Ontology of the Qur`anic Worldview



The entities that compose the observable world and directly interact with the human being are mainly *wealth* and *children* which constitute the allurements of earthly life. Here we find the natural, material economic and human resources needed by the human being to satisfy his biological needs from food, drink, clothes, shelter, and sexual urges. However, it is through the same process that the *self* recognizes the pleasures hidden in these resources when transformed into consumables, so much so that the demand for these goods goes beyond needs to become for pleasure. The other components of the observable world with which the human being interact consist of *earth* and *cosmos*, but it is the interaction with wealth and children, as defined in the Holy Qur`an, and their transformation into value added, that is primarily responsible for the emergence of social phenomena via social action and interaction.

The components of the level of the unobservable world consist of *Jinn*, including *Iblis* and his progeny (devils), *Angels*, *Paradise (Jannah)* and *Hell (Jahannam)* as shown in Fig. 7. These entities, though unobservable, still have influence on human actions and interactions as the Holy Qur`an tells us. The two entities of *Jinn* and *Angels* influence humans directly through their causal powers, while *Jannah* and *Jahannam* exert indirect influence by enabling and constraining the actions of believers (*Mu'minin*). As we will discuss when examining the *Tawhidi* social system in a coming section, *Jannah* and *Jahannam*, as the only final abodes of every human being after death, provide powerful enhancement, as incentives and sanctions respectively, to the efficacy of the self-organizing social relations in the *Tawhidi* social system. This interaction of the invisible world with the visible world demonstrates the stratification of reality, and the embeddedness of social reality in both levels of the observable and the unobservable and the complex vertical and horizontal processes that generate the human social reality.

Beyond these levels of reality there is Allah (SWT) the all-encompassing Creator and Knower of the two worlds of the observable and the unobservable. He is the subjugator over His servants, nothing in His kingdom can happen without His knowledge, His consent, command, or action, as the following verses tell us:

﴿ وَمَا تَكُونُ فِي شَأْنٍ وَمَا تَتْلُو مِنْهُ مِنْ قُرْآنٍ وَلَا تَعْمَلُونَ مِنْ عَمَلٍ إِلَّا كُنَّا عَلَيْكُمْ شُهُودًا إِذْ تُفِيضُونَ فِيهِ وَمَا يَعْزُبُ عَنْ رَبِّكَ مِنْ مِثْقَالِ ذَرَّةٍ فِي الْأَرْضِ وَلَا فِي السَّمَاءِ وَلَا أَصْغَرَ مِنْ ذَلِكَ وَلَا أَكْبَرَ إِلَّا فِي كِتَابٍ مُبِينٍ ﴾ (يونس)

«And, [O Muhammad], you are not [engaged] in any matter or recite any of the Qur-an and you [people] do not do any deed except that We are witness over you when you are involved in it. And not absent from your Lord is any [part] of an atom's weight within the earth or within the heaven or [anything] smaller than that or greater but that it is in a clear register (61) » (Yunus);

﴿ سَتُرِيدُنَا فِي الْأَفَاقِ وَفِي أَنْفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ الْحَقُّ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ كُلِّ شَيْءٍ شَهِيدٌ ۚ أَلَا إِنَّهُمْ فِي مِرْيَةٍ مِنْ لِقَاءِ رَبِّهِمْ أَلَا إِنَّهُ بِكُلِّ شَيْءٍ مُحِيطٌ ﴾ (فصلت)

«We will show them Our signs in the horizons and within themselves until it becomes clear to them that it is the truth. But is it not sufficient concerning your Lord that He is, over all things, a Witness?(53) Unquestionably, they are in doubt about the meeting with their Lord. Unquestionably He is, of all things, encompassing (54) » (Ha-Mim);

﴿وَهُوَ الْقَاهِرُ فَوْقَ عِبَادِهِ وَهُوَ الْحَكِيمُ الْخَبِيرُ ۱۸﴾ (الأنعام)

«And He is the subjugator over His servants. And He is the Wise, the Acquainted [with all] (18)» (Al-An'am);

﴿هُوَ اللَّهُ الَّذِي لَا إِلَهَ إِلَّا هُوَ الْمَلِكُ الْقُدُّوسُ السَّلَامُ الْمُؤْمِنُ الْمُهَيَّمِنُ الْعَزِيزُ الْجَبَّارُ الْمُتَكَبِّرُ سُبْحَانَ اللَّهِ عَمَّا يُشْرِكُونَ ۲۳﴾
﴿هُوَ اللَّهُ الْخَالِقُ الْبَارِئُ الْمُصَوِّرُ لَهُ الْأَسْمَاءُ الْحُسْنَى يُسَبِّحُ لَهُ مَا فِي السَّمَاوَاتِ وَالْأَرْضِ وَهُوَ الْعَزِيزُ الْحَكِيمُ ۲۴﴾ (الحشر)

«He is Allah, other than whom there is no deity, the Sovereign, the Pure, the Perfection, the Bestower of Faith, the Overseer, the Exalted in Might, the Compeller, the Superior. Exalted is Allah above whatever they associate with Him (23) He is Allah, the Creator, the Inventor, the Fashioner; to Him belong the best names. Whatever is in the heavens and earth is exalting Him. And He is the Exalted in Might, the Wise (24)» (Al-Hashr).

Thus, emerges the human being in his totality from, first, the internal interaction of his components of body and *self* grounded on the best organizational structure of *fitrah* (*endostructure*) and, second, from the external interaction and organizational structure between this *fitrah* and its environment (*exostructure*). This interaction and structuring which start the moment the child is born, beginning with the immediate environment of the family and gradually, as he gets older, will get entangled in the test of the allurements of the life on earth. Every human being will be molded into the person he will become depending on the initial immediate environment in which he is born and the various life-challenges he will face along the path of his development as the domain of his environment expands and the way he interacts with these challenges. From the perspective of QWV this path of development can be classified into two distinct paths and in-between: the *straight path*, the *astray path* and the *zigzag path*. Within each path there are myriads of roads and alleyways for people to follow reflecting the uniqueness of their personality and their choices in life as the following verses of the holy Qur'an tell us:

﴿وَلِكُلِّ وُجْهَةٍ هُوَ مُوَلِّجُهَا فَاسْتَبِقُوا الْعِخْرَاتِ أَيْنَ مَا تَكُونُوا يَأْتِ بِكُمْ اللَّهُ جَمِيعًا إِنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ ۱۴۸﴾ (البقرة)

«For each [religious following] is a direction toward which it faces. So race to [all that is] good. Wherever you may be, Allah will bring you forth [for judgement] all together. Indeed, Allah is over all things competent (148)» (Al-Baqara);

﴿وَأَنَّ هَذَا صِرَاطِي مُسْتَقِيمًا فَاتَّبِعُوهُ وَلَا تَتَّبِعُوا السُّبُلَ فَتَفَرَّقَ بِكُمْ عَنْ سَبِيلِهِ ذَلِكُمْ وَصَّاكُمْ بِهِ لَعَلَّكُمْ تَتَّقُونَ ١٥٣﴾
(الأنعام)

«And, [moreover], this is My path, which is straight, so follow it; and do not follow [other] ways, for you will be separated from His way. This has He instructed you that you may become righteous(153)» (Al-An'am).

All along this turbulent life-journey the *self* remains the essence of the individual but in his totality, he is more than the sum of his components (*body, self*) because he has emergent properties that each of these components lacks, e.g., he talks with his tongue, walks with his feet, handles things with his hands, he weeps, he laughs, he is hasty, he is miserly...etc. Man, in his totality, also has acquired properties from his components (*body, self*), e.g., weakness, hunger, satiation, thirst, nakedness, knowledge, mercy, justice, creativity... etc. However, more work needs to be done to figure out which are emergent, and which are acquired properties, which are properties, and which are states.

3.5- The Human Being as a System

The main purpose of this chapter is to explore in brief the main social systems derived from QWV from four systemic perspectives, namely, their composition, structure, environment and processes (mechanisms). We will start by exploring the human being as a system whose actions and interactions generate the general social systems introduced at the beginning of this chapter.

3.5.1- Composition of the System

The system of the human being consists of two components, or subsystems, the *body*, and the *self* systems, while the soul has become part of the properties of the *self* system through the process of emergence and therefore has no independent existence. Maybe this is why there is no mention in the Holy Qur`an of the soul as an independent causal power, while all sorts of power are attributed to the *self*. This may also solve the confusion between the two concepts of soul and *self* we find in classical Islamic scholarship as documented by Ibn al Qayyim in what we explored above in his book *al Rooh*.

3.5.2- Environment of the System

The environment of the human being as a system spans two levels of reality, that of the observable world and that of the unobservable world, as depicted by Fig. 7. The former mainly consists of the immediate environment of *wealth* and *children* in their material and social manifestations and the Holy Qur`an as a guiding revealed knowledge, together with *earth* and *cosmos*. The environment of the invisible world consists of *Jinn*, particularly *Iblis* and its *progeny*, Angels, particularly those assigned by Allah (SWT) to be the guardians of man in his worldly life and *Jannah* and *Jahannam* in their enabling and constraining roles on the actions and interactions of *Mu`minin*. Over and above these environments there is Allah (SWT) the all-encompassing Creator.

3.5.3- Structure of the System

We define the structure of the system as the sum of the organizational relationships between its components on the one hand and between these components and the components of their environment on the other hand. The first relationships are called *endostructure* and the second *exostructure*. We have to distinguish between two types of structural relationships in a system; those that bond its components and those that do not. The first are those that their existence or absence makes a difference to the components of the system, while the others are not. Only the bonding relations contribute to the cohesion of the components of the system, therefore they are considered part of its organizational structure.

3.5.3.1- The Internal structure

The internal structure of the system of the human being consists of three different types of bonds that bind the body and the *self*; the first is the constellation of sensory bonds like seeing, hearing, tasting, touching, smelling, walking...etc. These causal powers are necessary for the *self* in order to become acquainted with the external environment for two reasons; first, because it is the source of the biological needs of the human being, and second, it is the domain where the test that awaits man on this earthly life (wealth, children) exists. However, the tools that make this possible for the *self* are parts in the human body, e.g., eye, ear, tongue, foot, arm...etc.. Thus, comes the necessity of the structural bonding between the body and the *self*.

The second type of internal bonds are psychological in nature in the form of pleasure and joy, pain and anxiety which are experienced by the *self* in the process of satisfying the material needs of the body dwelling in the external environment (wealth, children). These are necessary bonds which guarantee for the body that the *self* will be forced to go after the biological needs of the body, bringing utilities and avoiding harm. In a way, they are like positive and negative incentives for the *self* to be in the service of the body, and in a wider context such bonds are necessary to guarantee that every human being will go through the test of the allurements of this earthly life and in the widest context, it shows the infinite knowledge, creativity and wisdom of Allah (SWT), the Designer of the Master Plan of Creation (MPC) and Guarantor of its implementation to its minutest detail, in time and space.

The third type of bonds are the spiritual bonds provided by the constellation of the created divine attributes, in their human relativity, responsible for moral conduct which the self, as a system, has acquired from the soul as one of its components. They include, among others, mercy, knowledge, justice, creativity, patience, gratitude, peace, cordiality, kindness, forbearance... etc. These divine properties in their ideal systemic organization around the attractor *Iman* define the ground state of “*best stature*” and the dynamic straight path as bearers of righteous human action. However, when this ideal system is dismantled by the wrongdoings of the individual and a new system of properties and states start to organize in the state space between the two attractors of *Iman* and *Kufr*, or inside the latter if a deliberate choice of *Kufr* is made by the individual, the opposite of these divine spiritual attributes may take their place, e.g., cruelty instead of mercy, impatience instead of patience, injustice instead of justice, ingratitude instead of gratitude, arrogance instead of modesty, ignorance instead of wisdom, miserliness instead of generosity, uncordiality instead of cordiality, and hostility instead of peace, ...etc. These new negative properties, generated as a result of deviating from the ground state of best stature, are emergent properties.

The created divine bonding properties in their ideal state provide perfect harmony between the biological needs of the body and the spiritual needs of the self. However, once the ideal system is dismantled, or distorted by following ways of actions other than those ordained by the Creator the entire ideal internal organizing structure that provides coherence and dynamic

stability to the system of the human being is weakened. The human *self* belongs to the *sub-atomic level* of reality and probably has the most complex system created by Allah (SWT), therefore, once a system is formed, whether within the boundaries of the *Iman* attractor- ground state of the *best stature* (أحسن تقويم)- or the boundaries of the *Kufr* attractor- *lowest of the low* (أسفل سافلين)- it becomes extremely difficult to alter because of the enormous energy needed over time to bring about the change. This is why purification of the self (تركيبية النفس) is such an arduous journey that has inspired a huge number of Sufi orders in Islam and spiritual traditions in other religions.

These moral causal powers, acquired and emergent, positive and negative, influence the interaction between the *self*, hence the individual, and its environment. However, for these processes to generate their causal effects the *self* needs the body. Thus, for example, to acquire knowledge the *self* needs the powers of seeing, hearing and cognition, but to make these powers effective the body is needed in terms of its relevant parts: eyes, ears, brain, heart... etc. If the intentions and purposes of the acquired knowledge are limited to the here and now world the *self* needs further organs in the body in order to generate those actions needed to realize the intended objectives, e.g., hands, legs, lungs, tongue, nose, nervous system...etc. If, on the other hand, the intentions and purposes extend to include the hereafter then further bodily aspects may be needed, e.g., fasting, praying, contemplating...etc.

3.5.3.2- The External Structure

The external structure consists of the relations between the human system on the one hand and the systems of his environment in the observable and unobservable worlds on the other.

There are three external relations corresponding to the three internal relations just mentioned which bind the individual with his immediate external environment at the level of the observable world (عالم الشهادة) where the test of the allurements of the earthly life (wealth, children) exists. The first bonds are the biological relations necessary to provide the body with its necessities of food, drink, cover, shelter, sex...etc. The second type of external bonds are those of lust for worldly pleasures (wealth, children) sought by the *self* as the following verse succinctly puts it:

﴿رَبِّنَا لِلنَّاسِ حُبُّ الشَّهَوَاتِ مِنَ النِّسَاءِ وَالْبَنِينَ وَالْقَنَاطِيرِ الْمُقَنْطَرَةِ مِنَ الذَّهَبِ وَالْفِضَّةِ وَالْخَيْلِ الْمُسَوَّمَةِ وَالْأَنْعَامِ وَالْحَرْثِ ذَلِكَ مَتَاعَ الْحَيَاةِ الدُّنْيَا وَاللَّهُ عِنْدَهُ حُسْنُ الْمَاَبِ ۝١٤﴾ (آل عمران)

«*Beautified for people is the love of that which they desire - of women and sons, heaped-up sums of gold and silver, fine branded horses, and cattle and tilled land. That is the enjoyment of worldly life, but Allah has with Him the best return (14)*» (Al-i'Imran).

The third type of external bonds is that between the human being on the one hand and Revelation, Earth and the Cosmos at large on the other. These relations are cognitive and moral in nature where man needs to know the systems that constitute the earth in order to carry his moral responsibilities as vicegerent and also to know the cosmic systems not only because earth is part of the cosmos but also to explore the potential benefits for man harbored by the distant cosmos.

Revelation as represented by the Holy Qur'an is part of the environment at the level of the observable world and, therefore, has external relations with human beings. Revelation provides man with the holistic worldview of existence, his place in it and his role as vicegerent on earth, the test he will go through and the ensuing accountability on the Day of Judgement (*Jannah, Jahannam*). Thus, Revelation activates the eclipsed properties of piety in the *self* so that their causal powers start to vie with those of debauchery which are already in active state since the birth of the individual.

We now explore in brief the organizing relations of man as a system with his environment in the unobservable world (عالم الغيب) and with Allah (SWT), his Creator. In the unobservable world I will limit myself to Iblis and his progeny (Satan) because they are the avowed enemies of human beings till the day of judgement and are equipped with diverse and potent arsenal of soft weaponry to sway man from the straight path. After all it is Iblis who, after disobeying Allah (SWT) by refusing to prostrate to Adam, convinced Adam, peace be upon him, to disobey the commands of Allah S(WT) while in paradise and as a result both Iblis, Adam and his wife were asked to descend to earth.

The external relations between man and Satan are necessary for the workings of the test for man on the allurements (wealth, children) of his earthly life, but they are hidden and the only authentic source of knowledge about them is the Holy Qur'an and prophetic Sunnah. The following verse summarizes the

eternal relations of enmity between the two:

﴿ قَالَ أَرَأَيْتَكَ هَذَا الَّذِي كَرَّمْت عَلَي لَئِنِ أَخَّرْتَنِي إِلَى يَوْمِ الْقِيَامَةِ لِآخْتِنِكُنَّ ذُرِّيَّتَهُ إِلَّا قَلِيلًا ۖ ٦٢ ﴾ ﴿ قَالَ أَذْهَبَ فَمَنْ تَبِعَكَ مِنْهُمْ فَإِنَّ جَهَنَّمَ جَزَاءُكُمْ جَزَاءً مَوْفُورًا ۖ ٦٣ ﴾ ﴿ وَاسْتَفْرَزْ مَنْ اسْتَطَاعَتْ مِنْهُمْ بِصَوْتِكَ وَأَجْلِبْ عَلَيْهِم بِخَيْلِكَ وَرَجِلِكَ وَشَارِكِهِمْ فِي الْأَمْوَالِ وَالْأَوْلَادِ وَعِدَّتِهِمْ وَمَا يَعِدُهُمُ الشَّيْطَانُ إِلَّا غُرُورًا ۖ ٦٤ ﴾ (الإسراء)

«[Iblees] said, «Do You see this one whom You have honored above me? If You delay me until the Day of Resurrection, I will surely destroy his descendants, except for a few.»(62) [Allah] said, “Go, for whoever of them follows you, indeed Hell will be the recompense of you - an ample recompense (63) And incite [to senselessness] whoever you can among them with your voice and assault them with your horses and foot soldiers and become a partner in their wealth and their children and promise them.” But Satan does not promise them except delusion (64)» (Israel).

The ultimate goal of Satan is to seduce man to go astray from the straight path in this worldly life and, therefore, to go to Hell with him in the hereafter, because Satan is cursed and expects no mercy from Allah (SWT) and is destined for Hell.

There are two types of bonding relations between Allah (SWT) and humans deduced by the author from the Holy Qur'an. One is indirect via what are which can be treated as indicators of (سنن الله) called the *established ways of Allah* :social laws. The following verses establish the concept of *Sunnat Allah*

﴿ سُنَّةَ اللَّهِ الَّتِي قَدْ خَلَتْ مِنْ قَبْلُ وَلَنْ تَجِدَ لِسُنَّةِ اللَّهِ تَبْدِيلًا ۖ ٢٣ ﴾ (الفتح)

«[This is] the established way of Allah which has occurred before. And never will you find in the way of Allah any change(23)» (Al-Fat-h)

﴿ فَلَمْ يَكُ يَنْفَعُهُمْ إِيمَانُهُمْ لَمَّا رَأَوْا بَأْسَنَا سُنَّتَ اللَّهِ الَّتِي قَدْ خَلَتْ فِي عِبَادِهِ وَخَسِرَ هُنَالِكَ الْكَافِرُونَ ۗ ٨٥ ﴾ (غافر)

«But never did their faith benefit them once they saw Our punishment. [It is] the established way of Allah which has preceded among His servants. And the disbelievers thereupon lost [all] (85)» (Al-Mu'min)

﴿ قَدْ خَلَتْ مِنْ قَبْلِكُمْ سُنَنٌ فَسِيرُوا فِي الْأَرْضِ فَانظُرُوا كَيْفَ كَانَ عَاقِبَةُ الْمُكْذِبِينَ ۖ ١٣٧ ﴾ (آل عمران)

«Similar situations [as yours] have passed on before you, so proceed throughout the

earth and observe how was the end of those who denied (137)» (Al-i'Imran).

﴿ اسْتَكْبَارًا فِي الْأَرْضِ وَمَكْرُ السَّيِّئِ وَلَا يَجِئُ الْمَكْرُ السَّيِّئُ إِلَّا بِأَهْلِهِ فَهَلْ يَنْظُرُونَ إِلَّا سُنَّتَ الْأَوَّلِينَ فَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَبْدِيلًا وَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَحْوِيلًا ٤٣ ﴾ (فاطر)

«[Due to] arrogance in the land and plotting of evil; but the evil plot does not encompass except its own people. Then do they await except the way of the former peoples? But you will never find in the way of Allah any change, and you will never find in the way of Allah any alteration (43)» (Fatir).

The second bonding relation between Allah (SWT) and humans is a direct one where every creature is under his subjugation as a Creator. This particular bonding relation is the one that gives credence to every other human bonding relation mentioned above because it is a relation founded on creator/creature, master/slave, deity/worshipper...etc. It is the scaffolding that anchors all other existential human relations.

3.5.4- How Does the Human System Work- its mechanisms?

Following the systems approach, I have described the human system in terms of its components, structure, and environment. It is time to examine how this system works to fulfil its objectives. The main objective of the human system has been identified in the Holy Qur'an in the following verses:

﴿ الَّذِي خَلَقَ الْمَوْتَ وَالْحَيَاةَ لِيَبْلُوَكُمْ أَيُّكُمْ أَحْسَنُ عَمَلًا وَهُوَ الْعَزِيزُ الْعَفُورُ ٢ ﴾ (المالك)

«[He] who created death and life to test you [as to] which of you is best in deed - and He is the Exalted in Might, the Forgiving (2) » (Al-Mulk);

﴿ وَهُوَ الَّذِي خَلَقَ السَّمَاوَاتِ وَالْأَرْضَ فِي سِتَّةِ أَيَّامٍ وَكَانَ عَرْشُهُ عَلَى الْمَاءِ لِيَبْلُوَكُمْ أَيُّكُمْ أَحْسَنُ عَمَلًا وَلَئِنْ قُلْتُمْ إِنَّكُمْ مَبْعُوثُونَ مِنْ بَعْدِ الْمَوْتِ لَيَقُولَنَّ الَّذِينَ كَفَرُوا إِنْ هَذَا إِلَّا سِحْرٌ مُبِينٌ ٧ ﴾ (هود)

«And it is He who created the heavens and the earth in six days - and His Throne had been upon water - that He might test you as to which of you is best in deed. But if you say, «Indeed, you are resurrected after death,» those who disbelieve will surely say, «This is not but obvious magic.» (7) » (Hud).

This ultimate purpose behind the creation of death and life, skies and earth

and resurrection after death is a test the domain of which are the allurements of earthly life (wealth, children):

﴿ إِنَّا جَعَلْنَا مَا عَلَى الْأَرْضِ زِينَةً لَهَا لِنَبْلُوهُمْ أَيُّهُمْ أَحْسَنُ عَمَلًا ۗ ﴾ (الكهف)

«Indeed, We have made that which is on the earth adornment for it that We may test them [as to] which of them is best in deed (7) » (Al-Kahf);

الْمَالُ وَالْبَنُونَ زِينَةُ الْحَيَاةِ الدُّنْيَا وَالْبَاقِيَاتُ الصَّالِحَاتُ خَيْرٌ عِنْدَ رَبِّكَ ثَوَابًا وَخَيْرٌ أَمَلًا ۖ ٤٦ ﴿ (الكهف)

«Wealth and children are [but] adornment of the worldly life. But the enduring good deeds are better to your Lord for reward and better for [one's] hope (46) » (Al-Kahf).

What is required from people in order to do justice to themselves in this world and in the hereafter is for them to pass the test in its domain of wealth and children by doing good deeds as defined by the Shari`ah. Not only that but they are encouraged to compete with each other in the good they are doing because *Jannah*, as a reward, is composed of vertical levels of quality life such that those who are best in deeds dwell in the highest levels:

﴿ وَلَكِنْ وَجْهَهُ هُوَ مَوْلَاهَا فَاستَبِقُوا الخَيْرَاتِ أَيْنَ مَا تَكُونُوا يَأْتِ بِكُمْ اللهُ جَمِيعًا إِنَّ اللهُ عَلَى كُلِّ شَيْءٍ قَدِيرٌ ١٤٨ ﴾ (البقرة)

«For each [religious following] is a direction toward which it faces. So, race to [all that is] good. Wherever you may be, Allah will bring you forth [for judgement] all together. Indeed, Allah is over all things competent (148) » (Al-Baqara)

﴿ إِنَّ الْأَبْرَارَ لَفِي نَعِيمٍ ٢٢ ﴾ ﴿ عَلَى الْأَرَائِكِ يُنظَرُونَ ٢٣ ﴾ ﴿ تَعْرِفُ فِي وُجُوهِهِمْ نَضْرَةَ النَّعِيمِ ٢٤ ﴾ ﴿ يُسْقَوْنَ مِنْ رَحِيقٍ مَخْتُومٍ ٢٥ ﴾ ﴿ جَتَامَهُ مِسْكِ وَفِي ذَلِكَ فَلْيَتَنَافَسِ الْمُتَنَافِسُونَ ٢٦ ﴾ (المطففين)

«Indeed, the righteous will be in pleasure (22) On adorned couches, observing (23) You will recognize in their faces the radiance of pleasure (24) They will be given to drink [pure] wine [which was] sealed (25) The last of it is musk. So, for this let the competitors compete (26) » (Al-Mutaffifin).

The goal of doing good in the domain of the test of wealth and children and grounding the highest ranks in *Jannah* on excelling in doing such good work demand from each competitor to look for those means that will enable him to get the optimal outcome from his work given all the constraints he faces:

﴿ يَا أَيُّهَا الَّذِينَ آمَنُوا اتَّقُوا اللَّهَ وَابْتَغُوا إِلَيْهِ الْوَسِيلَةَ وَجَاهِدُوا فِي سَبِيلِهِ لَعَلَّكُمْ تُفْلِحُونَ ﴿٣٥﴾ (المائدة)

«O you who have believed, fear Allah and seek the means [of nearness] to Him and strive in His cause that you may succeed (35) » (Al-Maidah);

﴿ أُولَئِكَ الَّذِينَ يَدْعُونَ يَبْتَغُونَ إِلَىٰ رَبِّهِمُ الْوَسِيلَةَ أَيُّهُمْ أَقْرَبُ وَيَرْجُونَ رَحْمَتَهُ وَيَخَافُونَ عَذَابَهُ إِنَّ عَذَابَ رَبِّكَ كَانَ مَحْذُورًا ﴿٥٧﴾ (الإسراء)

«Those whom they invoke seek means of access to their Lord, [striving as to] which of them would be nearest, and they hope for His mercy and fear His punishment. Indeed, the punishment of your Lord is ever feared (57) » (Israel).

These means are the best social processes that link righteous social actions of Muslims as causes with their expected consequences in a given social system. Such essential processes are called *mechanisms* in the system approach we are adopting in this research. Thus, we are in the business of finding out those natural and social mechanisms which Allah (SWT) has designed in such a manner as to make the human system work with maximum efficiency and guarantee that every human being will go through the test of the allurements (wealth, children) of this earthly life.

Remembering what we said in section one above about self-organizing complex systems and what that means for human social systems it is obvious that the above verses describe a human system designed by Allah (SWT) to generate maximum synergy at the biological level and maximum common good at the social level if the normative divine injunctions of do and don't do are followed by human beings. In the next chapter where we derive the four most general social systems implied by the Qur`anic worldview (QWV) we will argue that only the *Tawhidi* social system is capable by divine design to maximize the common good, while the other three social systems have built-in mechanisms of instability and ultimate disintegration.

Essential processes for the human body are those required for its upkeep, beginning with the biological necessities of the body from nutrients, for instance, food, clothing, water, housing...etc., and procreation needed for the continuation of the human race.

﴿إِنَّ لَكَ أَلَّا تَجُوعَ فِيهَا وَلَا تَعْرَىٰ﴾ ﴿٨١﴾ ﴿وَأَنَّكَ لَا تَظْمَأُ فِيهَا وَلَا تَصْحَىٰ﴾ ﴿١١٩﴾ (طه)

«Indeed, it is [promised] for you not to be hungry therein or be unclothed (118) And indeed, you will not be thirsty therein or be hot from the sun.” (119) » (Ta-ha).

The only source of satisfaction for these biological necessities are the components of the allurements of earthly life, namely *wealth* and *children*. Therefore, when the body is deficient in one of its biological necessities it triggers the relevant material mechanisms in the form of biological, chemical and physical signals inside the body to indicate the need to satisfy these necessary urges. The body, in order to make the self become aware of its needs, triggers those necessary mechanisms that blur some of the fundamental properties of the *self* the efficacy of which requires the cooperation of the body, e.g., seeing, hearing, smelling, touching, walking...etc. These blurring mechanisms can reduce the *self's* capabilities until it cannot function anymore, depending on the body's needs. The *self* from its part, in order to restore the functioning of its weakened properties, has to provide for the needs of the body. It, therefore, triggers the appropriate psychological mechanisms that force the human being in his wholeness to go after satisfying the needs of the body. Some of the psychological mechanisms are hunger, thirst, shame, feelings of extreme weather, sexual desire...etc. These psychological mechanisms are very effective because each causes a particular type of intolerable pain appropriate to the pressing biological need which forces the individual to hurry for its satisfaction. The individual, from his part, triggers the most potent of all human mechanisms, the *social action* appropriate for procuring the necessity required by the body. It is this social action that generates and guarantees the interaction between humans on the one hand, and between humans and their external environment on the other hand, which is the intended goal behind all the antecedent mechanisms. This very process ensures that every normal human being will go through the test of wealth and children, and the resulting social interactions generate social relations ushering in what we call the social system, with its micro-macro dialectics.

When the body's biological needs are met, a counteractive series of physical, chemical, biological, psychological, and social processes commence. These functions deter the body from consuming more than necessary of the sources fulfilling these needs, guarding against potential harm. However, at this stage

the human *self* would have already discovered, through the mechanisms of taste, the various alluring pleasures hidden in wealth and children. This ushers in a new type of demand for wealth and children over and above that necessitated by the body, namely demand by the *self* for the pleasures with which wealth and children are endowed. The most important mechanisms for this kind of demand are psychological and grouped in the Holy Qur`an under one name: "whims" (هوى).

The initial social action carried out by the individual in order to satisfy the biological urges of his body brings him in touch with all the components of his external environment depicted in Fig. 7 above. These include wealth, children, earth, cosmos, Revelation, Angels, Jinn and, beyond these created components, Allah (SWT), the all-encompassing Creator. Thus, man makes his compulsory entry into the test of his worldly life ordained for him by his Creator, but after the initial entry each individual exercises his free will, within constraints, to choose the path he will follow in the alleyways of his testing environment. The dynamics of his life to follow will determine its end results in this *Dunya* and in the *Akhirah*. At this new stage and, as a result of the interaction with the external environment and the structural relationships between its components, the individual starts developing his worldview which will govern the way he sees and evaluates the world and how he relates to it. His social actions and interactions will be conditioned by his worldview, the self will be gradually dominated by various types of acquired and emergent properties that reflect its path of development in the test of wealth and children. In the domain of the *Iman* attractor, where the divine properties of the soul system, in their ground state of *Fitra*, dominate the tranquil human self, these properties will mediate the actions and bond the interactions of *Mu'minin*. Thus, it is the soul system of divine properties, in its ground state of *Fitra*, which will make the scaffolding that anchors the ensuing social relations in the *Tawhidi* social system. The self also goes through various states generated by the manifestation of its dispositional properties of transgression which characterize the domain of the *Kufr* attractor, mediate actions, bond interactions and anchor the ensuing social relations in the secular social system. In real-world situations the *Mu'min* goes through states that reflect the interplay between transgression and piety motives, while the *Kafir*, in general, is dominated by states generated by transgression motives. In this latter case, though the divine attributes of the soul system remain active,

e.g., the perception properties of *seeing, hearing, knowing*, the locomotive properties like *power*, the moral properties like *mercy, justice...etc.*, however, are manipulated for purely secular purposes, some of which are beneficial, while others are harmful. They are severed by *Kufr* from their original divine source that transforms them into spiritual powers.

The stage of the individual coming in contact with the external environment ushers in the emergence of social interactions which lead to the emergence of societies and social systems. At this stage various types of social mechanisms are triggered, depending on the nature of the social system under consideration; some generate the system, some maintain it, some change it, and others dismantle it. In the next chapter we consider these issues from the Qur`anic worldview perspective in the emergent social domain of reality.

تم بحمد الله

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Chapter 6

Towards a General Theory of Social Systems (2)

EMERGENCE AND FUNCTIONING OF MACRO SOCIAL SYSTEMS

(An Islamic Perspective)

1- Introduction: Self-organization in Complex Social Systems

Let us remind ourselves again of what is meant by a social system from the perspective of systemism:

1. A social system is a concrete system composed of gregarious animals that (a) share an environment; (b) act upon other members of the system; and (c) cooperate in some respects and compete in others.
2. A human social system is a social system composed of human beings and their artifacts, held together by feelings, beliefs, moral and legal norms, and mutually related actions.
3. A human social system can be (a) natural (spontaneous) if it emerges by way of free association or reproduction (e.g., families, circle of friends, street-corner gangs); (b) formal (designed) if it is formed in compliance with explicit rules or plans (e.g., schools, armies, business firms, political parties, NGOs).
4. A human society is a social system composed of four major subsystems: (a) biosocial system, whose members are bound together by sexual, kinship, and friendship relations; (b) economic system, the bonds of which are relations of production and exchange; (c) political system, characterized by the coordination and management of social activities and the struggle

for power; and (d) cultural system, the members of which engage in cultural or moral activities like learning, teaching, inventing, designing, singing, painting, and so on.

Self-organization and emergence are a feature of social systems, of their becoming and of their being. Social systems belong to a different level of reality, and, like physical and biotic systems, they are endowed with relative autonomy and specific laws. Being complex systems, it is self-organization that social systems ultimately share with other systems. In social systems, actors' agencies reproduce the structure of the social system. Conversely, the agencies can also co-act to transform the structure in order to change the system qualitatively.

“There are two levels. At the micro-level the elements of the system, namely agents, are located. They carry out actions, and by the interplay of the fluctuating individual actions they produce fairly stable relations among them which, in the form of rules, that is values, ethics and morals, and in the form of regularities which concern allocative and authoritative resources, gain a relative independence from the interactions. Structures like that emerge thus on a macro- level, where they exist in their own right in so far as they, in turn, influence the agents. On the one hand, they constrain the individual agency by setting conditions that limit the scope of possibilities to act and, on the other, just by doing so provide it with the potential for realizing options it would not otherwise have. In so far as the structures do not cause directly, and therefore cannot determine completely whether or not these options will be realized, for the actions are mediated by the individual agents, dominance cannot control the outcome, either. The structures are inscribed in the individual agents by an endless process of socialization and enculturation, but the engrams which are produced in the individuals serve as cognitive tools for the anticipation and construction of ever new actions which may or may not obey the rules and accept the values and recognize the ethics and follow the morals, and which may or may not fit the regularities and renew the allocative and authoritative resources and thus may or may not reproduce the structures. Either way, interaction reflects upon the conditions of its own emergence and may consciously be directed at the structures in order to maintain or alter them. In this sense only, that is, because in their recursive actions the agents refer to the structures, these structures play the dominant role in this relation of bottom-up and top-down causation. Nevertheless, none of the relations in this causal cycle leads to plain results. Each influence has consequences which due to the inherent

indeterminacy cannot be foreseen. By this, and only by this, qualitative change is possible."¹⁴

Based on the systems paradigm the object of social sciences ought not to be a particular substance but rather social systems, which means the social relations that organize matter in a different way than in realms of, biotic, and physical matter. Social relations define the context. The object of social-scientific inquiry comprises (1) the actors that co-act to such an extent that the social system is reproduced or transformed, (2) the social relations that emerge from and, through the provision of constraints and enablers, dominate their interaction, and (3) the interplay between actors and social relations, in which the actors remain in the space determined by social relations or transgress it and in which the social relations turn up as intended or turn out to be unintended consequences. This is in line with a general definition of systems that includes (a) elements, (b) organizing relations, and (c) their interplay, which is self-organization.

Why do complex, self-organizing systems exist at all? The answer is that systems are formed and then maintained if elements, and as long as elements, benefit from the system. Self-organizing systems emerge through organizational relations when cooperation of agents allows for synergy effects; the provision and production of synergy are the reasons for the existence of any system. If the organizational relations are no longer able to provide and help the elements produce synergy, then the system will break down. This means that Systems Theory is also *normative*. It can describe spaces of possibilities that might or might not be realized by the agents. It can describe possibilities that lead from one state of the system to a state that better fulfils functions desired by the agents and marks a *higher order* of the social system- in which case the higher order is a *good*. And it can describe *unsustainable* states- which then are *evils*- and possibilities to get rid of dysfunctions harmful to agents. By describing goods and evils and how they can be set out for or left behind, systems thinking makes explicit that it is *value-laden* and crosses the border from description to prescription.

What does *synergy* in social systems mean? Social systems crystallize in social relations that allow the *proliferation* of the *common good* for participant actors.

14- Hofkirchner: Social relations: Building on Ludwig von Bertalanffy

Any social system is a social system by virtue of *organizational relations* of production and provision of the common good. That is to say, the *commons* are the social manifestation of systemic synergy. That good comes into being through the common effort of actors' combined productive energies and is located on a social system's macro-level. It is a relational good that influences actors on the micro-level, since it enables or constrains the actors' participation in producing and consuming the good.

Hindrances of the commons supply are *frictions* that represent systemic *dysfunctions* due to the suboptimal organization of the synergetic effects. The less friction is present in the interaction of actors as a consequence of relations promoting the common good, the more enduring are social systems. Any *meaningful design* of social systems is oriented towards the alleviation of frictions.

What are the global challenges that face humanity today about? Global challenges embody a crisis in the worldwide availability of the common good. They show that a reorganization is needed that is about the common good. Social relations can be categorized as follows with respect to how they deal with global challenges:

- (1) *Antagonistic* relations that make positions on the common good conflict with each other in a contradictory, mutually exclusive manner. The common good is appropriated by actors at the cost of the expropriation of other actors. Those relations threaten humanity with extermination because antagonistic actors tend towards eliminating their competitors.
- (2) *Agonistic* relations that make different positions regarding the commons indifferent to, and therefore enable coexisting with, each other in a compossible manner. They seem indispensable for social life because they promise peaceful competition and help defuse antagonisms. There is, however, no guarantee for that. Not only can antagonistic relations be transformed into agonistic ones, but agonisms can also change into antagonisms. Accordingly, they do not suffice for collective action on a planetary scale.
- (3) *Synergistic* relations that enable mutually supportive positions that complement each other for the common good and for any other human(e)

goal, humanity-wide. The composition tunes the differences and yields *unity through diversity*.

Given these categories, science can take position and recommend what needs to be done if humanity is to survive: Antagonistic relations must be reduced to a minimum, and agonistic relations must be put in the service of truly synergistic relations to enact another step in human evolution. Such a transition is necessary because the social relations of any segment of humanity are increasingly based on the exclusion of other segments that are not considered part of them. This fails to do justice to legitimate self-interests of the rest of segments. Frictions from which the global challenges emanate render the continuation of civilization unsustainable. They are caused by the lack of relations that would be valid for all humanity from a *metalevel* perspective. The establishment of such relations would mean the abolition of those frictions by a new *supra-system* in which all existing systems take part and shape according to the new relations on a higher level.

The *design* of social systems: Unity through diversity, a principle found in natural self-organizing systems, can also be adapted to hold for society, i.e., social systems and social self-organization, based on the following crystallization: It is both possible and desirable to transform the social relations from antagonistic and agonistic forms into synergistic forms that in themselves will be appropriate to handle the commons on a planetary level, to guide global governance, and to enable a thriving and surviving human civilization.¹⁵

2- The Four Macro Social Systems Of QWV

The present author, as stated before, is attempting to develop a general systems' theory in the domain of social reality grounded on the Qur'anic Worldview. This is a hybrid theory given the typology of systems science introduced in chapter three because it combines some general principles of systems, e. g., *emergence* and specific manifestations of such principles in a particular domain of reality- social reality. Three immediate benefits for Islamization of social knowledge can be expected from the present general theory of social systems, the first is that it should provide an integrating framework for all specialized knowledge of social systems because such

15- Hofkirchner: The Commons from a Critical Social Systems Perspective

specialized knowledge will either be about some aspects of the general social systems, e.g., economic, political, cultural...etc., or about components of such systems at the meso-level, e.g., institutions and organizations. The second benefit is that such general theories provide the nucleus of the knowledge base necessary for specialized disciplines to emerge. The third benefit, which arises from our belief as Muslims that the Holy Qur`an is the apodictic knowledge from Allah (SWT) about Himself and about His creation, is that a general social systems theory like the one sketched here has the potential of providing us with the most authentic human knowledge about how these social systems work in reality and the processes (mechanisms) that are at work to generate social phenomena. This, of course, depends on the methodologies with which we approach the Holy Qur`an as a conceptual system and the empirical validation of the theories we derive from it. This is the same scientific approach in studying the real world where the observed real world is always independent of the observer and his knowledge about it and provides a check on the validity of such knowledge.

Four fundamental macro human social systems can be derived from the systemic QWV depicted in Fig. 1 below. They are the general Natural Social System, the Tawhidi Social System, the Secular Social System and the hybrid Real-world Social System. The model in Fig. 2 represents a theoretical construct of the human natural social system grounded on the assumption that before it starts functioning all its individual actors are in the ideal state according to which every human being is created by Allah (SWT) as stated by the Qur`anic verse:

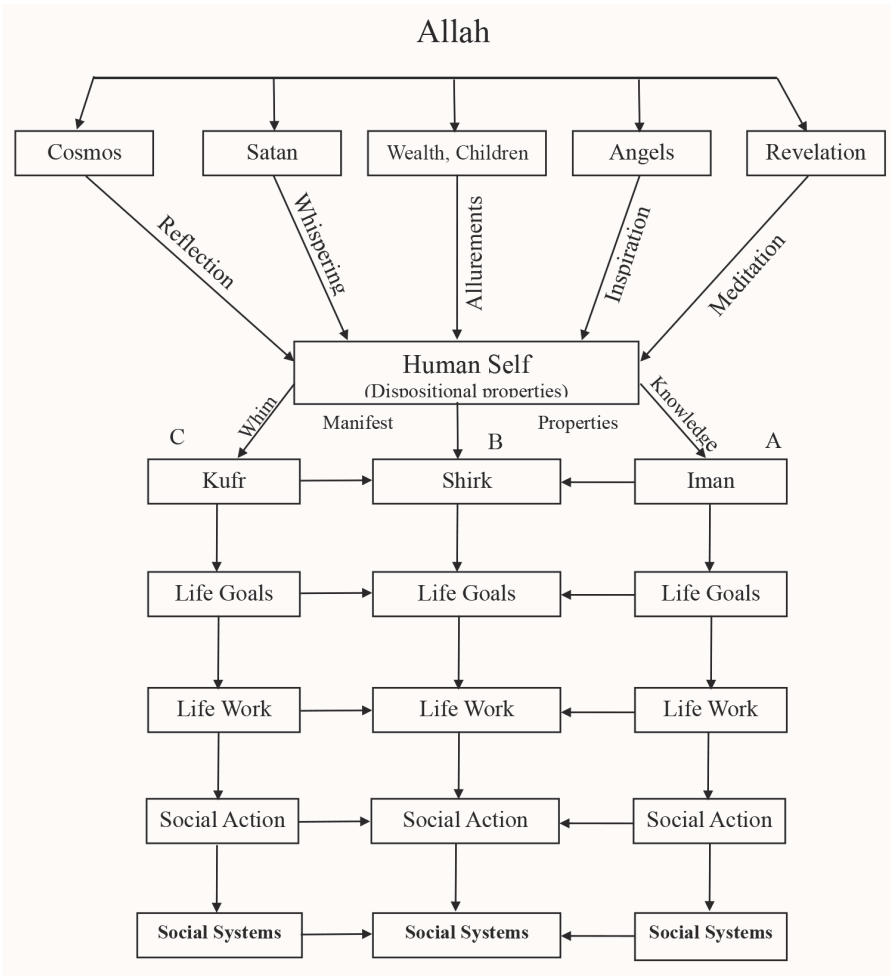
﴿لَقَدْ خَلَقْنَا الْإِنْسَانَ فِي أَحْسَنِ تَقْوِيمٍ ۚ﴾ (التين)

«We have certainly created man in the best of stature;(4)» (At-Tin).

This is the state we have modelled in the QWV, in chapter 4, as the state where the human soul system of the created divine attributes is ideally ordered around the divine attribute of “*Iman*” as the *attractor* of the system. The human body system is ideally fashioned to combine, via some of its elements, with this soul system in the womb of the mother and out of this combination a new entity called “*Self*” emerges which is a system that possesses novel properties that are absent from its two component subsystems- *soul*,

body. It is this emergent self, in its interaction with the human body, that gives every individual human being his individuality. The self with its dialectical components of body and soul and its dispositional properties of “transgression” and “piety” is ideally suited for the test that every normal human being has to go through in this worldly life. This test is that of doing good in the worldly pleasures of “wealth” and “children” with which earth is endowed as resources to be managed by man as vicegerent. Enough details have been given in chapter 5 about the emergence of man and in the remaining sections of this chapter more details will be given about the emergence of human social systems. What is important here is that this ideal state according to which every man is fashioned represents the *ground state* from which every individual starts his adventure in worldly life. His life trajectory develops along or in between two polar paths: the *strait path* defined by his Creator and the *path of whims*, which is the path of Satan, the avowed enemy of man and of his Creator. The Holy Qur’an identifies “whims” as the chosen god of man when he declines the message of his Creator. By “whims” we mean the totality of the innate biological and psychological cravings that drive man towards the indulgence in worldly pleasures and guide his goals and actions in life. In the language of complex systems, we may say that the life of the individual human being, in his wholeness as a complex system (self, body, environment), defined by his actions and interactions, oscillates between two attractors: *Iman* and *Kufr*, with *Shirk* as an in-between state space. This is also reflected in the main social systems (organizing social relations) resulting from this polarity in the attractors, namely the Tawhidi Social System, the Secular Social System and hybrid Real-world social system. All these intricate issues are well captured by the flow chart of QWV in Fig. 1, columns A, C and B respectively. Elaboration on these issues will follow in the remaining sections of this chapter, Insha’Allah.

Fig. 1: Qur`anic Worldview



The human social system is defined here as *natural* if no divine *Revelation* is brought down by Allah (SWT) to the actors in the system according to which they have to make a deliberate choice between belief in Allah (SWT) and thus design and structure their social system according to His sacred injunctions, or disbelief and accordingly design their social system on the basis of discordant alternatives. The analytical value of the assumed natural social system is

that it enables us to have an idea about the true nature of human beings and thus, their expected actions and interactions in different situations, beside the social structures and processes that propel the evolution of the social system in the absence of any divine guidance. Furthermore, we can examine the interplay between those mechanisms that advance, maintain, or dismantle the system and the conditions which enable the system to achieve social self-organization as defined in the previous section. All these analytical gains will help us understand the functioning of the other social systems, which are but the limits to the natural social system when the latter responds to divine revelation either by completely embracing it, thus generating the Tawhidi Social System, or by completely rejecting it which will yield the Secular Social System, or lastly, by half-half acceptance and practice of the injunctions of Revelation which results in the Hybrid Social System. The Hybrid Social System represents the real-world social systems.

The next section will include our attempt to use the approach of systemism developed by Bunge and detailed in previous chapters to explore these four social systems derived from QWV in terms of their *composition, structure, environment, and mechanisms*. It is a preliminary study that awaits further elaborations. However, it is necessary to remind ourselves of what Mario Bunge said, namely, that it is not sufficient to study social systems in terms of their CESM only but also in terms of their essential biosocial, economic, political, and cultural subsystems. Later, in the Tawhidi social system we will separate the knowledge system from the cultural system for good reasons and give prominence to the former.

3- The General Natural Social System

The general natural social system (GNSS) is a hypothetical social system as depicted in Fig. 2 below. The purpose behind hypothesizing this system is to shed light on how it works to fulfil its functions, the main processes at work and the possible evolutionary outcomes of the interplay of these causal mechanisms, given the assumption that Allah (SWT) has not sent any messenger to such society. These processes are always present in any real human society, but their empirical consequences depend on myriad of factors in time and space. In this respect let us remind ourselves of the following from chapter 1 in this book:

Critical realists argue that reality has an “ontological depth” that can be understood as three overlapping domains, which reflect the vertical dimension, or stratification, of reality. The domain of the ‘real’ embraces the structures and mechanisms that generate actual events and states of affairs, which we may experience in different ways and which we may not experience at all. The domain of the ‘actual’, which embraces the events and states of affairs we may or may not experience, is therefore a subset of the ‘real’, and the domain of the ‘empirical’, which embraces what we do experience is therefore a subset of the ‘actual’.

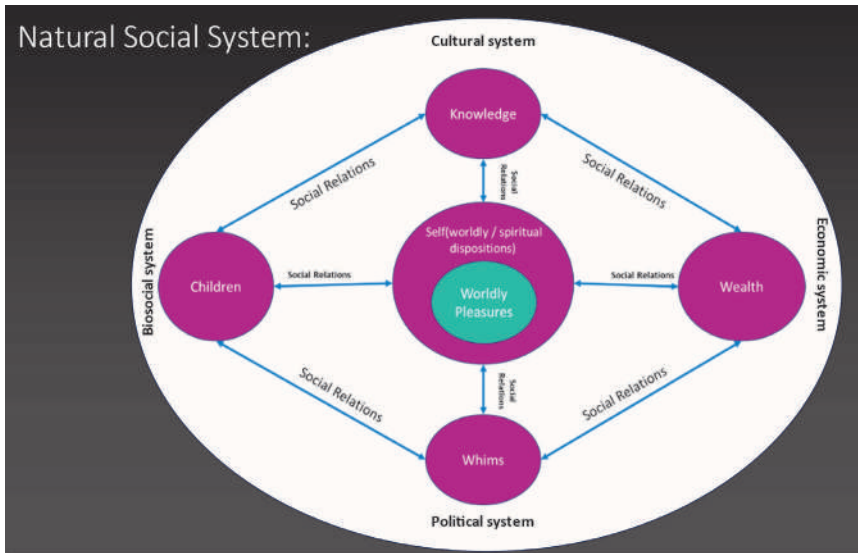
The assumption of no messenger from Allah (SWT) and therefore no revelation enables us to examine the workings of the Master Plan of Creation (MPC) in its natural setting as designed by Allah (SWT) and to understand why it is imperative to send prophets and send down Revelation. It also tells us something about the importance of intervention via designed social policies to mitigate frictions in designed social systems and strengthen processes and organizational structures that maximize the common good.

The natural social system as assumed is a spontaneous system like any other system in nature, its dynamics are guided by impulsive inclinations. However, the difference between this human natural social system and other natural systems is that the latter have predetermined built-in self-organizing mechanisms and processes that bring order to a system experiencing disorder, while human elements of a social system have a sufficient degree of freedom to exercise free will in engineering their own man-made social and technological processes that may, or may not bring the required order to the social system, or may even exacerbate disorder. The Qur`anic model of the human self, which is the pivotal causal power in the natural social system, is the one dominated by the dispositional properties of transgression. These are as described in the previous chapter and become manifest once activated by actions and interactions in the domain of worldly allurements (wealth, children).

The main function of such a natural human social system is to enable its human agents to satisfy their cravings for the common good which is, given the assumed nature of the system, *pleasure* coming from the consumption of wealth and children. This common good must also include all the necessary means for the elements (actors) of the system to realize their goal. Thus, the

natural social system in its self-organizing dynamics must reach a synergistic configuration of social relations that enable actors to satisfy their biological urges and the pleasures derived therefrom. There are secondary cultural commons which include the spiritual needs generated by the manifestation of the dispositional spiritual properties of the self. In the absence of revelation, such properties will relate the self, one way or another, to the world of the unknown and generate man-conceived beliefs in supernatural powers. Since, by assumption, there is no revelation to awaken the piety states of the properties of the soul system generated by belief in Allah (SWT), the various constellations of these properties in the self: sensory, moral, cognitive, locomotive...etc., will be guided by human natural urges and will be utilized mainly for worldly endeavors. This also means that the dominant properties of the self which guide actions and interactions are those acquired from its body component, or emerge as a result of the exercise of such properties, e.g., weakness, anxiousness, hastiness, arrogance, pride, dishonesty, miserliness... etc.

Fig. 2: Natural Social System



The assumption of no revelation also implies that the people who constitute this system will not be directly punished by Allah (SWT) for not believing in Him, or any action therefrom, because Allah (SWT) stated clearly in the Holy Qur'an that He will not punish until He send a messenger as the following verses state:

﴿ مَن اهْتَدَىٰ فَإِنَّمَا يَهْتَدِي لِنَفْسِهِ وَمَن ضَلَّٰ فَإِنَّمَا يَضِلُّ عَلَيْهَا وَلَا تَزِرُ وَازِرَةٌ وِزْرَ أُخْرَىٰ وَمَا كُنَّا مُعَذِّبِينَ حَتَّىٰ نَبْعَثَ رَسُولًا ﴿١٥﴾ وَإِذَا أَرَدْنَا أَن نُّهْلِكَ قَرْيَةً أَمَرْنَا مُتْرَفِيهَا فَفَسَقُوا فِيهَا فَحَقَّ عَلَيْهَا الْقَوْلُ فَدَمَّرْنَاَهَا تَدْمِيرًا ﴿١٦﴾ (الإسراء)

«Whoever is guided is only guided for [the benefit of] his soul. And whoever errs only errs against it. And no bearer of burdens will bear the burden of another. And never would We punish until We sent a messenger (15) And when We intend to destroy a city, We command its affluent but they defiantly disobey therein; so the word comes into effect upon it, and We destroy it with [complete] destruction (16)» (Israel).

The people of the natural social system will, however, be subject to the universal ways of Allah SWT (سنن الله - *Sunan*) that are relevant to their particular situation. These *Sunan* govern human existence and nothing can replace or transfer them as the following verses state:

﴿ سُنَّةَ اللَّهِ فِي الَّذِينَ خَلَوْا مِن قَبْلُ وَلَنْ تَجِدَ لِسُنَّةِ اللَّهِ تَبْدِيلًا ﴿٦٢﴾ (الأحزاب)

« [This is] the established way of Allah with those who passed on before; and you will not find in the way of Allah any change (62)» (Al-Ahzb);

﴿ سُنَّةَ اللَّهِ الَّتِي قَدْ خَلَتْ مِن قَبْلُ وَلَنْ تَجِدَ لِسُنَّةِ اللَّهِ تَبْدِيلًا ﴿٢٣﴾ (الفتح)

«[This is] the established way of Allah which has occurred before. And never will you find in the way of Allah any change (23)» (Al-Fat);

﴿ قَدْ خَلَتْ مِن قَبْلِكُمْ سُنَنٌ فَسِيرُوا فِي الْأَرْضِ فَانظُرُوا كَيْفَ كَانَ عَاقِبَةُ الْمُكْفِرِينَ ﴿١٣٧﴾ (آل عمران)

«Similar situations [as yours] have passed on before you, so proceed throughout the earth and observe how was the end of those who denied (137)» (Al-i'Imran);

﴿ اسْتِكْبَارًا فِي الْأَرْضِ وَمَكْرَ السَّيِّئِ وَلَا يَجِئُ الْمُكْرَ السَّيِّئِ إِلَّا بِأَهْلِهِ فَهَلْ يَنْظُرُونَ إِلَّا سُنَّتَ الْأَوَّلِينَ فَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَبْدِيلًا وَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَحْوِيلًا ﴿٤٣﴾ (فاطر)

«[Due to] arrogance in the land and plotting of evil; but the evil plot does not encompass except its own people. Then do they await except the way of the former peoples? But you will never find in the way of Allah any change, and you will never find in the way of Allah any alteration (43)» (Fatir).

﴿ لَهُ مُعَقَّبَاتٌ مِنْ بَيْنِ يَدَيْهِ وَمِنْ خَلْفِهِ يَحْفَظُونَهُ مِنْ أَمْرِ اللَّهِ إِنَّ اللَّهَ لَا يُغَيِّرُ مَا بِقَوْمٍ حَتَّى يُغَيِّرُوا مَا بِأَنْفُسِهِمْ وَإِذَا أَرَادَ اللَّهُ بِقَوْمٍ سُوءًا فَلَا مَرَدَّ لَهُ وَمَا لَهُمْ مِنْ دُونِهِ مِنْ وَالٍ ۗ وَال ۙ ۙ ﴾ (الرعد)

«For each one are successive [angels] before and behind him who protect him by the decree of Allah. Indeed, Allah will not change the condition of a people until they change what is in themselves. And when Allah intends for a people ill, there is no repelling it. And there is not for them besides Him any patron (11)» (Ar-Ra'd),

﴿ ذَلِكَ بِأَنَّ اللَّهَ لَمْ يَكُ مُغَيِّرًا نِعْمَةً أَنْعَمَهَا عَلَى قَوْمٍ حَتَّى يُغَيِّرُوا مَا بِأَنْفُسِهِمْ وَأَنَّ اللَّهَ سَمِيعٌ عَلِيمٌ ۗ ﴾ (الأنفال)

«That is because Allah would not change a favor which He had bestowed upon a people until they change what is within themselves. And indeed, Allah is Hearing and Knowing (53)» (Al-Anfal)

:as follows “We give our own definition of the “way of Allah

Every volitional and regular action done by an individual or a group of people to generate intended effects, then confirmed and prevailed over by a Divine action germane to it and leads it via natural causes, social causes, or both to effects determined by Allah (SWT). These effects could be equal to those intended by the actor(s) from his/their action(s) or more, or could be different and unintended by the actor(s). They may be limited to the targets intended by the actor(s), or go beyond them to include the actors themselves and beyond. These ways of Allah (SWT) are always effective when their social conditions are met. They neither change in composition and structure or effects, nor miss their intended target.

We may think of these *Sunan* as indicators of social laws that can be conjectured theoretically and then tested empirically. Social laws are exhausted by social causes, social mechanisms and social effects. Such laws should be looked at as tendencies rather than as constant conjunctions according to the philosophy of critical realism. This is particularly true given the present Islamic perspective within which we are dealing with social knowledge because social events at the empirical level are generated by a myriad of processes and states of affairs

at the real level which spans both the visible and invisible worlds. Therefore, there is no guarantee that any particular causal mechanisms will materialize into their expected effects, e.g., the wrongdoers who deserve the wrath of Allah (SWT), which brings them under certain Sunan of punishment, may repent in due time to prevent the Sunnah from taking effect.

The *Sunan* include social, natural and other processes to bring into effect the social law implied by the specific *Sunnah*, e.g., we may conjecture the following social law from the above verse (Fatir, 43):

** Evil plotting always befalls and afflicts only its doers.*

The verse then puts this social law under the umbrella of the unreplaceable and untransferable ways (*Sunan*) of Allah (SWT). Thus, once we are able to give an operational definition to the concepts of *Sunnat-Allah* and of “*evil plotting*” we may then proceed to identify those social actions and social processes that satisfy such a definition as causes and as mechanisms, respectively, and predict the social and natural consequences that will be expected to befall the social system whose actors are behind such evil plotting. In principle, if we correctly understood the meaning of the verse and were able to infer the social law and express it in an unambiguous language then, though it is logically falsifiable, there will be no instance of historical data or events that will falsify the law, because firstly, Allah (SWT) says in the verse that the relevant historical facts (سنة الأولين) corroborate the law. Secondly, the efficacy of the law is guaranteed by His unreplaceable and untransferable Sunnah. Thirdly, the positivist problem of verification cannot arise here, because Allah (SWT), the Creator of the world and the all-knowing of every instance of its events, past, present and future, and whose word is the ultimate truth, said that the law is true. However, since our inference remains an informed human cognitive conjecture on revelation logical and empirical validation will be necessary.

Sometimes the Holy Qur`an mentions a social law directly without relating it to a specific Sunnah. Let us take the following two examples, one from the wealth domain but with systemic ramifications, and the other from the global society.

﴿ مَا آفَاءَ اللَّهِ عَلَى رَسُولِهِ مِنْ أَهْلِ الْقُرَى فَلِلَّهِ وَلِلرَّسُولِ وَلِذِي الْقُرْبَىٰ وَالْيَتَامَىٰ وَالْمَسَاكِينِ وَابْنِ السَّبِيلِ حَيْثُ لَا يَكُونُ ذُوْلَةً بَيْنَ الْأَغْنِيَاءِ مِنْكُمْ وَمَا آتَاكُمُ الرَّسُولُ فَخُذُوهُ وَمَا نَهَاكُمْ عَنْهُ فَانْتَهُوا وَاتَّقُوا اللَّهَ إِنَّ اللَّهَ شَدِيدُ الْعِقَابِ ٧ ﴾ ﴿ لِلْفُقَرَاءِ الْمُهَاجِرِينَ الَّذِينَ أُخْرِجُوا مِنْ دِيَارِهِمْ وَأَمْوَالِهِمْ يُبْتَغُونَ فَضْلًا مِنَ اللَّهِ وَرِضْوَانًا وَيُنصِرُونَ اللَّهَ وَرَسُولَهُ أُولَئِكَ هُمُ الصَّادِقُونَ ٨ ﴾ (الحشر)

And what Allah restored to His Messenger from the people of the towns - it is» for Allah and for the Messenger and for [his] near relatives and orphans and the [stranded] traveler - so that it will not be a perpetual distribution among the rich from among you. And whatever the Messenger has given you - take; and what he has For (7) forbidden you - refrain from. And fear Allah; indeed, Allah is severe in penalty the poor emigrants who were expelled from their homes and their properties, seeking bounty from Allah and [His] approval and supporting Allah and His Messenger, .([there is also a share]. Those are the truthful (8)» (al-Hashr

We infer from these verses the following general social law:

** Concentration of wealth (economic power) in any society leads to exclusion from the commons in the economic and other domains of the social system.*

This general social law harbors many other domain-specific social laws some of which have been mentioned by Mario Bunge as follows¹⁶:

1. The concentration of economic power is accompanied by a concentration of political and cultural power,
2. Poverty stunts physiological development,
3. Malnutrition and lack of skills hinder increase in productivity,
4. pronounced social inequality hinders economic growth,
5. The cohesiveness of a social system is proportional to the participation of its members in various groups and activities, and decreases with segregation,
6. Sustained development is at once economic, political, and cultural.

16 - Bunge, M (2013): The Sociology-Philosophy Connection. Transaction publishers, New Brunswick (USA), and London (UK).

Now, for the global social law inferred from the following verse:

﴿ قَبْلَ عَسَيْتُمْ إِنْ تَوَلَّيْتُمْ أَنْ تُفْسِدُوا فِي الْأَرْضِ وَتُقَطِّعُوا أَرْحَامَكُمْ ۚ ﴾ (محمد)

«So, would you perhaps, if you turned away, cause corruption on earth and sever your [ties of] relationship? (22)» (Muhammad).

* Turning away from Iman results in earth's corruption and social dissolution.

This law could apply for the global meta social system, or could be limited to a specific local social system, e.g., family, company, army...etc. Historical human experience at all levels of social reality amply demonstrates the truth of this law. But, given our definition of Sunnah, what psychological and social laws of change can we infer from the Sunan in the following verses, given the fact that Allah SWT does not impact His Sunnah on people through miracles but through the operation of the appropriate natural, psychological and social laws:

﴿ وَإِذْ تَأَذَّنَ رَبُّكُمْ لَئِن شَكَرْتُمْ لَأَزِيدَنَّكُمْ وَلَئِن كَفَرْتُمْ إِنَّ عَذَابِي لَشَدِيدٌ ۗ ﴾ (إبراهيم)

«And [remember] when your Lord proclaimed, «If you are grateful, I will surely increase you [in favor]; but if you deny, indeed, My punishment is severe.» (7)» (Ibrahim,;

﴿ مَنْ عَمِلَ صَالِحًا مِنْ ذَكَرٍ أَوْ أُنْثَىٰ وَهُوَ مُؤْمِنٌ فَلَنُحْيِيَنَّهٗ حَيَاةً طَيِّبَةً وَلَنَجْزِيَنَّهُمْ أَجْرَهُمْ بِأَحْسَنِ مَا كَانُوا يَعْمَلُونَ ۙ ﴾ (النحل)

«Whoever does righteousness, whether male or female, while he is a believer - We will surely cause him to live a good life, and We will surely give them their reward [in the Hereafter] according to the best of what they used to do (97)» (An-Nahl);

﴿... إِنَّ اللَّهَ لَا يُغَيِّرُ مَا بِقَوْمٍ حَتَّىٰ يُغَيِّرُوا مَا بِأَنْفُسِهِمْ وَإِذَا أَرَادَ اللَّهُ بِقَوْمٍ سُوءًا فَلَا مَرَدَّ لَهُ وَمَا لَهُمْ مِنْ دُونِهِ مِنْ وَالٍ ۗ ﴾ (الرعد)

«... Indeed, Allah will not change the condition of a people until they change what is in themselves. And when Allah intends for a people ill, there is no repelling it. And there is not for them besides Him any patron (11)» (Ar-Ra'd).

﴿ذَلِكَ بِأَنَّ اللَّهَ لَمْ يَكُ مُغَيِّرًا نِعْمَةً أَنْعَمَهَا عَلَى قَوْمٍ حَتَّى يُغَيِّرُوا مَا بِأَنْفُسِهِمْ وَأَنَّ اللَّهَ سَمِيعٌ عَلِيمٌ ٥٣﴾ (الأنفال)

«That is because Allah would not change a favor which He had bestowed upon a people until they change what is within themselves. And indeed, Allah is Hearing and Knowing (53)» (Al-Anfal)

Thus, it seems the Sunan of Allah (SWT) are the scaffolding that anchors social laws, so whenever we encounter a Sunnah mentioned in revelation, and they are plenty, we can search for the implied social laws, and whenever social laws are explicitly mentioned by revelation without anchoring them in Sunan, we can look for the relevant Sunan in revelation. In this way we can maintain in a systematic manner the bottom-up and top-down causal relationships between the different levels of reality implied by the systemic ontology of QWV.

The social laws which can be conjectured from the Sunan of Allah (SWT) mentioned in the Holy Qur`an and enriched by further social laws discovered empirically can be useful in the explanation of the complex problems that engulf humanity today. The failure of mono-disciplines to explain these complex problems has led to the present shift in the scientific enterprise towards the systems paradigm. A lot of theorizing is required by Muslim social scientists to unearth the psychological models and social relations and mechanisms which will make these social laws operative.

Despite the secular spirit of the natural social system the human agents of this system enter under the umbrella of some of the all-encompassing compassionate divine attributes, e.g., “kindness” and “mercy”, and Allah (SWT) alone determine which of the two relationships will govern His decree. The following verses sum up these divine compassionate attributes:

﴿قُلْ لِمَنْ مَا فِي السَّمَاوَاتِ وَالْأَرْضِ قُلْ لِلَّهِ كَتَبَ عَلَى نَفْسِهِ الرَّحْمَةَ... ١٢﴾ (الأنعام)

«Say, “To whom belongs whatever is in the heavens and earth?” Say, “To Allah.” He has decreed upon Himself mercy...(12)» (Al-An`am);

﴿...وَاللَّهُ رَءُوفٌ بِالْعِبَادِ ٣٠﴾ (آل عمران)

«... and Allah is Kind to [His] servants.” (30)» (Al-i`Imran);

﴿...إِنَّ اللَّهَ بِالنَّاسِ لَرءُوفٌ رَحِيمٌ ٦٥﴾ (الحج)

«... Indeed Allah, to the people, is Kind and Merciful (65)» (Al-Hajj).

This relationship with Allah (SWT) takes place at two levels, the first is direct as the following verses state:

﴿وَإِذَا سَأَلَكَ عِبَادِي عَنِّي فَإِنِّي قَرِيبٌ أُجِيبُ دَعْوَةَ الدَّاعِ إِذَا دَعَانِ فَلْيَسْتَجِيبُوا لِي وَلْيُؤْمِنُوا بِي لَعَلَّهُمْ يَرْشُدُونَ ١٨٦﴾
(البقرة)

«And when My servants ask you, [O Muhammad], concerning Me - indeed I am near. I respond to the invocation of the supplicant when he calls upon Me. So let them respond to Me [by obedience] and believe in Me that they may be [rightly] guided (186)» (Al-Baqara);

﴿وَقَالَ رَبُّكُمْ ادْعُونِي أَسْتَجِبْ لَكُمْ إِنَّ الَّذِينَ يَسْتَكْبِرُونَ عَن عِبَادَتِي سَيَدْخُلُونَ جَهَنَّمَ دَاخِرِينَ ٦٠﴾ (غافر)

«And your Lord says, «Call upon Me; I will respond to you.» Indeed, those who disdain My worship will enter Hell [rendered] contemptible (60)» (Al-Mu'min);

﴿أَفَنُجِيبُ الْمُضْطَرَّ إِذَا دَعَا وَنَكْشِفُ السُّوءَ وَنَجْعَلُكُمْ خُلَفَاءَ الْأَرْضِ أَلَيْسَ مَعَ اللَّهِ قَلِيلًا مَّا تَذَكَّرُونَ ٦٢﴾ (النمل)

«Is He [not best] who responds to the desperate one when he calls upon Him and removes evil and makes you inheritors of the earth? Is there a deity with Allah? Little do you remember (62)» (An-Naml).

The second relationship with Allah SWT is indirect through the ways of Allah “sunan” that govern all human conditions in time and space:

﴿وَاتَّقُوا فِتْنَةً لَا تُصِيبَنَّ الَّذِينَ ظَلَمُوا مِنْكُمْ خَاصَّةً وَاعْلَمُوا أَنَّ اللَّهَ شَدِيدُ الْعِقَابِ ٢٥﴾ (الأنفال)

«And fear a trial which will not strike those who have wronged among you exclusively, and know that Allah is severe in penalty (25)» (Al-Anfal);

﴿سُنَّةَ اللَّهِ فِي الَّذِينَ خَلَوْا مِن قَبْلُ وَلَنْ تَجِدَ لِسُنَّةِ اللَّهِ تَبْدِيلًا ٦٢﴾ (الأحزاب)

«[This is] the established way of Allah with those who passed on before; and you will not find in the way of Allah any change(62)» Al-Ahzab;

﴿ اسْتِكْبَارًا فِي الْأَرْضِ وَمَكْرَ السَّيِّئِ وَلَا يَجِئُ الْمَكْرُ السَّيِّئُ إِلَّا بِأَهْلِهِ فَهَلْ يَنْظُرُونَ إِلَّا سُنَّتَ الْأُولِينَ فَلَنْ نَجِدَ لِسُنَّتِ اللَّهِ تَبْدِيلًا وَلَنْ نَجِدَ لِسُنَّتِ اللَّهِ تَحْوِيلًا ٤٣ ﴾ (فاطر)

«[Due to] arrogance in the land and plotting of evil; but the evil plot does not encompass except its own people. Then do they await except the way of the former peoples? But you will never find in the way of Allah any change, and you will never find in the way of Allah any alteration (43)» (Fatir).

Thus, the dynamics of the natural social system run the gamut from secular social outcomes to Tawhidi social outcomes when the presence of revelation is assumed and agents of the social system are forced to make a choice between *Iman* and *Kufr*, with these two social extremes as its limits. Real-world social systems are the union of these limiting social systems as the unfolding of this chapter will show.

3.1- Components of the system

The natural social system is composed of natural people whose nature is as described in the model of the human self, developed in chapter 5, together with the material artifacts they create from the natural resources of the environment. We assume that they are all born in the best stature of *fitrah* as described in the Holy Qur`an and expounded by us in the last chapter. This implies that they are neither believers in Allah (SWT) nor disbelievers at the moment of birth and have equal chance of going either way:

﴿ وَاللَّهُ أَخْرَجَكُمْ مِنْ بُطُونِ أُمَّهَاتِكُمْ لَا تَعْلَمُونَ شَيْئًا وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ لَعَلَّكُمْ تَشْكُرُونَ ٧٨ ﴾ (النحل)

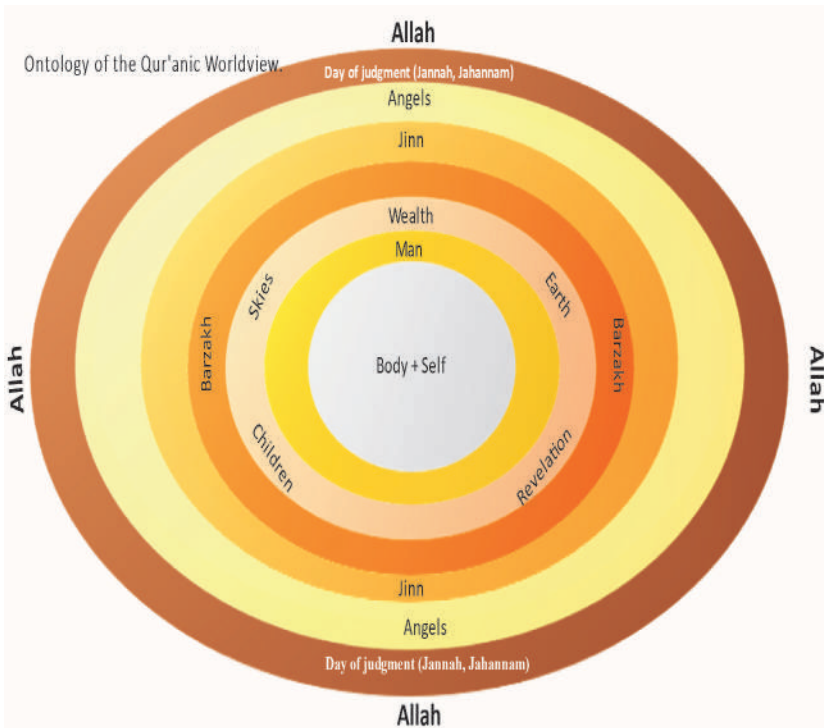
«And Allah has extracted you from the wombs of your mothers not knowing a thing, and He made for you hearing and vision and intellect that perhaps you would be grateful (78)» (An-Nahl).

We also assume that no revelation has been sent down to them in order to influence their choices in their mundane earthly life which means their knowledge is limited to what they accumulate by experience in their interaction with the observable world (عالم الشهادة) only, though the unobservable world is present, and its components exercise their causal powers in the components of the observable world. Over and above that the omnipresence of Allah (SWT) is always there.

3.2- Environment of the System

The environment of the system, as can be deduced from Fig. 3 below, is composed of two types, the immediate observable world (earth, cosmos) and the unobservable world of Jinn, particularly Satan, and Angels, while Jannah and Jahannam have influence only via revelation which we assumed away for this natural social system. Above that we have the all-encompassing presence of the Creator, Allah (SWT). Wealth and children now represent the natural social system itself via social relations that mediate the actions of human agents in the economic and biosocial domains. Before, they were part of the environment of the micro human system.

Fig. 3: Ontology of QWV



3.3- Structure of the System

The structure of the natural social system consists of an *endo* and an *exostructure*. The first relates the internal components of the system, while the latter relates these internal components to the components of the external environment. The internal bonds of social relations between individual actors who compose the system depend on the particular domain of the social relations where individuals act and interact, and on the cultural framework that govern these social relations. In general, these social relations, which are independent of the individual agents of the system, enable and constrain their social actions, e.g., in the biosocial domain defined by the universal (children), we find moral, ethical, and legal bonding relations which define the dos and don'ts of the sexual relationship between females and males. These constrained and enabled relationships then lead to the emergence of the family as a social institution, both in its nuclear and extended forms. The nuclear family as a system has different internal structural bonding relations between its components, e.g., between the husband and wife, between parents and children, between children depending on the type of sex, (boys or girls). Some of these internal relational bonds are moral like cordiality, mercy, love, respect, jealousy, hate...etc., some reflect the economic aspect of family life like justice, beneficence, trust, frugality, generosity...etc. The immediate external bonding relations for the family, or its members (components, elements) are those with neighbors, friends, school, work...etc. We can move to examine the bonding social relations of the family at the level of the extended family... etc. We should remember that there are relations that are bonds and others that are not, only the former should be considered part of the structure of the system, according to systemism.

The economic (wealth) domain of the social system is the domain where allocative decisions about economic resources and goods are made and is dominated by relations of production and exchange. These economic bonds take different forms, e.g., relations of dominance and exploitation and exclusion, relations of equity and inclusion, relations of altruism and self-denial...etc. The political domain of the system is where authoritative decisions about managing the overall society are made and political power is contested. The bonding social relations could be those of loyalty, those of deceit, dominance...etc. In the cultural domain the bonding social relations depend on the institutional setup, e.g., educational, religious, research, arts...

etc. A justified criticism here may be that allowing such institutions in the natural social system will turn it into a designed one. We have to strike a balance between what social relations and institutions can evolve naturally within this assumed natural social system and those that transform the system to a designed one.

Generally, though these bonding social structures are stable and independent of the individuals whose actions and interactions generate them, they are, nevertheless, dynamic and liable to change over time. This change in the internal social structure brings with it change in the overall social system and in the self systems of actors.

The external bonding relations are those between the individuals composing this natural social system and the components of the environments of the observable and the unobservable worlds and beyond that the relationship with Allah (SWT). The bonding relations in the observable world are those between the human agents of the natural social system and the natural resources of the earth, where knowledge gained by experience is used to utilize these resources for worldly purposes. Empirical knowledge in this natural social system has purely an instrumental role and is guided by human desire to satisfy worldly enjoyments and by the social dynamics that ensue.

There are also the relations with the seemingly supernatural powers of the cosmos because, given the inherent weakness of the human being, he always looks for strength in other deities. Our assumption of the absence of revelation from this natural social system opens up all types of bonding relations between its human agents and the unobservable world where the agents surrender themselves to assumed invisible and omnipotent powers. Such relations are based on fear and hope from the part of the human agents because the intrinsic property of weakness of humans as stated by the Holy Qur`an forces them to seek refuge in an external deity, who may be Allah (SWT), Angels, devils, sun, moon, sorcerers, or even man-made god. Such deity will be bestowed with all the properties of perfection that man lacks.

Given our introduction of the concept of self-organization of complex social systems an imperative question is this: What kind of organizational social relations (attractors) will enable the natural social system to achieve self-organization, given the model of the nature of the human self as defined by

the Qur`anic worldview (QWV)? Are such configurations of social relations, if ever realized, sustainable?

To answer the first question let us remember that self-organizing systems emerge through organizational relations which make possible cooperation between the agents of the system to generate synergy effects. The production and provision of synergy are the reasons for the existence of any system: If the organizational relations are no longer able to provide and help the elements produce synergy, then the system will break down. Social systems crystallize in social relations that allow the *proliferation* of the *common good* for participant actors. Any social system is a social system by virtue of *organizational relations* of production and provision of the common good. That is to say, the *commons* are the social manifestation of systemic synergy. That good comes into being through the common effort of actors` combined productive energies and is located on a social system`s macro-level. It is a relational good that influences actors on the micro-level, since it enables or constrains the actors` participation in producing and consuming the good.

From the perspective of QWV the commons that are shared by all human social systems and should provide in order to sustain themselves are the preservation of the three material subsystems (self, wealth, children) on the basis of which any human social system is erected. Thus, the answer to the above question amounts to finding that configuration of bonding social relations which guarantees, not only a production of the commons sufficient for all the agents of the system, but also a distribution process which guarantees that every single agent will procure what is sufficient for him to preserve his necessities of self, wealth and children. Only this configuration of bonding social relations will make all agents benefit from the commons and, thus have interest in maintaining the social system, otherwise, the disadvantaged will work towards dismantling it.

Given our assumptions about the natural social system, and without going into details, the *attractor* of social relations in the domain of *Wealth* can be summarized by the dictum: "*From each according to his abilities, to each according to his needs*". What is the *attractor* of the primary social relations in the domain of *Children*, i.e., sexual relations between males and females? It seems the only viable relation is that which can be summarized as follows: "*Mutual*

consent without commitment". As for the *attractor* in the domain of *Self* it can be summarized by the dictum: "*Live and let live*".

Given our Qur`anic model of the human self, and our assumptions about the natural social system, and given the possible attractors of social relations just mentioned, can such preferred configurations of the system be sustained for protracted periods of time?

The answer to this question will be briefly considered in the following section where we examine the processes (mechanisms) that make the natural system tick, but we can say here that the stabilizing configurations of social relations in the natural social system are unsustainable due to the nature of the dominant properties of the human self at the micro level, the implied objectives of the actors and their consequent actions and interactions that determine the bonding social relations and thus, the evolutionary states of the natural social system.

3.4- How the Natural Social System Works- its mechanisms

We have elaborated, in chapter 5, on the physical, chemical, biological, and psychological mechanisms of the human system that guarantee the entanglement of man in the test of the allurements of this worldly life (wealth, children). All these mechanisms take place inside the human system (body, self). However, in the social system the mechanisms are social and spiritual processes through social action and interaction, within the frameworks of the internal and external social structures (relations). Let us remember that by mechanisms we mean those essential processes that take place inside the system and enable it to perform its functions and give it its unique identity, e.g., teaching is the mechanism that gives the school its identity, medication is the mechanism that gives the hospital its identity, research is the mechanism that gives research centers their identity and so on. According to Bunge all mechanisms are lawful, i.e., they link causes to their effects and, therefore, provide deep explanation of how the cause generates its effects. These mechanisms are usually hidden and, just as in the generation of scientific hypotheses, the Muslim researcher has to use his creative mind, motivated and constrained by data sourced from Revelation and/or the empirical world, to develop theories about the mechanisms under investigation. Empirical testing will validate or falsify the truth claims of these theories.

In the social system under consideration mechanisms are generated only by the three material components, namely, *self*, *wealth* and *children* while the other two components of *knowledge* and *culture*, being conceptual and semiotic systems, can only have effects through the human self. Two primary and complementary mechanisms are generated from the interaction between these three components, the first is *bio-psychosocial* and may be called, invoking Qur`anic terminology, “*love for lusts of wealth and children*”. The following verse summarizes these primary mechanisms in both domains of wealth and children:

﴿ زُيِّنَ لِلنَّاسِ حُبُّ الشَّهَوَاتِ مِنَ النِّسَاءِ وَالْبَنِينَ وَالْقَنَاطِيرِ الْمُقَنْطَرَةِ مِنَ الذَّهَبِ وَالْفِضَّةِ وَالْخَيْلِ الْمُسَوَّمَةِ وَالْأَنْعَامِ وَالْحَرْثِ ذَلِكَ مَتَاعُ الْحَيَاةِ الدُّنْيَا وَاللَّهُ عِنْدَهُ حُسْنُ الْمَآبِ ١٤ ﴾ (آل عمران)

«*Beautiful for people is the love of that which they desire - of women and sons, heaped-up sums of gold and silver, fine branded horses, and cattle and tilled land. That is the enjoyment of worldly life, but Allah has with Him the best return (14)*» (Al-i'Imran).

The second primary mechanism is *psychosocial* and, using Qur`anic jargon, may be called “*competition in increase of wealth and children*” as the following verse states:

﴿ اعْلَمُوا أَنَّمَا الْحَيَاةُ الدُّنْيَا لَعِبٌ وَلَهُمْ زِينَةٌ وَتَفَاخُرٌ بَيْنَكُمْ وَتَكَاثُرٌ فِي الْأَمْوَالِ وَالْأَوْلَادِ كَمَثَلِ غَيْثٍ أَعْجَبَ الْكُفَّارَ نَبَاتُهُ ثُمَّ يَهِيجُ فَتَرَاهُ مُصْفَرًّا ثُمَّ يَكُونُ حُطَامًا وَفِي الْآخِرَةِ عَذَابٌ شَدِيدٌ وَمَغْفِرَةٌ مِنَ اللَّهِ وَرِضْوَانٌ وَمَا الْحَيَاةُ الدُّنْيَا إِلَّا مَتَاعُ الْغُرُورِ ﴾ (الحديد) ٢٠

«*Know that the life of this world is but amusement and diversion and adornment and boasting to one another and competition in increase of wealth and children - like the example of a rain whose [resulting] plant growth pleases the tillers; then it dries and you see it turned yellow; then it becomes [scattered] debris. And in the Hereafter is severe punishment and forgiveness from Allah and approval. And what is the worldly life except the enjoyment of delusion (20)*» Al-Hadid).

Thus, the first primary mechanism is goal-directed, the goal being the enjoyment of worldly pleasures, while the second primary mechanism is means-directed, the means being the acquisition of the sources of these worldly pleasures. Let us examine the nature of these two primary types of mechanisms (*bio-psychosocial*, *psychosocial*) in the *biosocial* subsystem, where the component *Self* interacts with the component *Children*. The concept of *self*

is a generic concept. Its usage determines the relevant conceptual meaning assigned to it. Here *self* denotes man in his totality as explained in chapter 5. The concept of *children* is also generic, denoting the primary *sexual relationship* between men and women and then the *offspring* who are the result of such relationship.

In the biosocial subsystem the *bio-psychosocial* mechanism is manifest mainly in “*sexual desire*” and “*offspring desire*”, the fulfilment of which leads to the emergence of kinship institutions, e.g., family, kinsfolk, tribe...etc. Because we assumed the natural social system to be spontaneous and without divine guidance, the attempt to satisfy sexual desires generate, beyond the biological and psychological mechanisms at the micro individual level, different and opposing mechanisms at the macro social level, e.g., the mechanism of *marriage*, but also the mechanism of *cohabitation* and, in the extreme, we may end up with *same sex* marriages and cohabitation. Notice that these social mechanisms have direct link to the type of properties dominating the human self at the time of the social action and interaction, as well as to the type of social relations dominant in the particular social domain. However, since we have made the assumption of no revelation, the entire self system in the natural social system will be guided by “*whims*” not “*divine knowledge*”, and the dominant social relations will be those of “*mutual consent without commitment*”.

These social processes and mechanisms will generate further germane social processes and mechanisms. Take as an example the *mechanism of marriage* which is expected to lead to the emergence of the family institution, nuclear and extended, and beyond that to kinship institutions like tribes. We will see opposing mechanisms emerging within the kinship system, some based on properties coming from the soul system like *mercy, cordiality, patience, justice...* etc., which will generate further like mechanisms, e.g., *love, compassion, cooperation, sympathy...etc.*, and some on properties coming from the body system like *weakness, haste, greed, miserliness...etc.*, which will generate further germane mechanisms, e.g., *discontent, contention, betrayal, divorce, conflict* and ultimately may cause even *war*. Both opposing mechanisms will be operational at the same time and vie against each other in the social subsystem defined by the interaction between the two entities of *Self* and *Children*. Because, as mechanisms, they are unobservable, only their ultimate consequences will be

observed as social events, given the other constituents of the level of reality at which they operate and with which they interact.

To avoid confusion between the primary higher-level bio-psychosocial and psychosocial mechanisms and these intermediate mechanisms, let us call the latter the spiritually-based and the materially-based mechanisms, based on their origins in the soul and body subsystems of the self, respectively. The spiritually-based mechanisms lead to the maintenance and stability of the family system while the materially-based mechanisms lead to the instability and ultimately to the dismantling of the family system. Either outcomes will lead to further germane individual and social consequences that extend beyond the immediate family system to the kinsfolk and tribal systems. Given the dominance of whims in the natural social system the mechanisms of social wear and tire are likely to dominate and the tendency of the natural system will be to decay and disintegrate, or at least in a state of continuous instability.

Let us take, instead of marriage, the case of *cohabitation* outside wedlock between men and women, or same *sex cohabitation* as a social mechanism of sexual satisfaction in the interaction between the two components *self* and *children*. This mechanism is likely to emerge from the dominance of the *transgression* properties of the self resulting in general, among other phenomena, in single parents` family which will trigger germane individual and social processes and mechanisms in the same way described for the marriage mechanism just mentioned, e.g., jealousy, envy, betrayal, deception, separation, love, etc. Because *whims*, by assumption, are the dominant guiding reference for actions and interactions, the evolutionary path of change in the natural social system will be again that of decay and the system will ultimately be dismantled.

The second type of the two primary mechanisms generated by the interaction between self and children is *psychosocial* and can be called "*competition in increase of children*" and founded on the dual nature of the human self (*transgression, piety*) generated by the dual composition of the self (*body, soul*). It is because we assumed away the piety state of the self by our assumption of no revelation, we limit the designation of this primary mechanism to *libertine* inspirations. This type of mechanisms is triggered by the operation of the bio-psychosocial mechanisms mentioned above, two of which, mentioned by the Holy Qur`an, are *boasting* and *propagation* of wealth and children. Theories

can be developed to show how these mechanisms work in the subsystem of kinship and, given the Qur`anic model of the self, and how their net effects will be to weaken the social fabric of the natural system.

Thus, we can conclude that the subsystem of children, in the absence of any guidance by revelation from Allah (SWT), will be dominated by micro and macro processes that set the evolutionary path of dismantling the system.

The two primary *bio-psychosocial* (*love for the lust of wealth*) and *psychosocial* (*competition for increase in wealth*) mechanisms in the *wealth* subsystem, where the *self* component interacts with the *wealth* component, are processes driven by maximizing behavior in production and exchange and in consumption, given the Qur`anic model of the human self. In the sphere of production, these processes lead to the emergence of different types of ownership systems for the *means of production*, e.g., *private* and *public* and their germane *relations of production*. In the distribution sphere will emerge different types of exchange systems like *barter* and the *market*. Aggregate demand will manifest itself in the emergence of different systems of consumer and investment demand, e.g., *private* and *public*. All these systems have their mechanisms and, given the grounding assumptions of the natural social system, will be dominated by those mechanisms which reflect their *libertine* lineage, e.g., *cut-throat competition*, *monopoly*, *class struggle*, and *consumerism*. In the jargon of the Holy Qur`an these are the mechanisms of making wealth “*perpetual distribution among the rich*«. These types of economic systems and mechanisms will lead to further social manifestations such as, in the Qur`anic jargon, *immorality* (الفحشاء), *bad conduct* (المنكر) and *oppression* (البغي). Ultimately, these economic processes will lead to a class-stratified society, a society of exclusion, a society of haves and have-nots, afflicted by conflict and its path of evolution characterized by social revolution and devolution. The natural social system is unlikely to settle in its attractor, where the social relations in the wealth subsystem are summarized by the dictum: “*from each according to his abilities, to each according to his needs*”.

The above does not rule out the possibilities of mechanisms that work in the opposite direction in order to maintain and stabilize the natural social system and mitigate the dismantling effects of the negative mechanisms in the wealth sphere, e.g., *cooperation*, *reconciliation*, *consultation* and *participation*.

However, the effects of such positive mechanisms cannot match the effects of the domineering negative mechanisms which we labeled “*love for the lust wealth*” and “*competition to increase in wealth*” which are characteristic of such type of social systems. Thus, we reach the same conclusion that in the absence of guidance from *divine revelation* the economic processes in the natural social system will augment its devolution.

The full understanding of the working of all the above mechanisms such that the interaction between the three subsystems of *self, wealth and children* leads to the *emergence* of the natural social system and its different *kinship, economic, political and cultural* aspects require developing theories about these mechanisms. We have only listed some of the most salient mechanisms relevant to the social subsystems generated by the interaction of the three material entities of *self, wealth and children*.

One last point concerns the relationship between the biosocial and the economic subsystems which are two aspects of the general natural social system. Obviously, they are internally bonded, e.g., production in the economic system requires workers who are produced by families in the biosocial system. For families to breed and rear children who will become workers they need food, drink, shelter...etc., which are produced by the economic system. This reciprocal supply/demand relationship between the two social systems is pivotal for their emergence, maintenance and evolution. In fact, these relations also impact emergent social relations in the political and cultural domains of the natural social system and ultimately link all these macro social subsystems with the micro self system because humans are the agents in all subsystems.

The above internal mechanisms of the natural social system intertwine with external mechanisms generated by the interaction of its components with the components of its environment and with Allah (SWT). The effects coming from the external environment could be augmenting or offsetting to the effects of the internal mechanisms, thus determining the state of the social system at a particular point in time and space. The most influential external entity, given our assumption of no revelation, is Iblis and his progeny (devils), the avowed enemies of Adam and his progeny since their first inception and until the Day of judgement as the following verse states:

﴿فَقُلْنَا يَا آدَمُ إِنَّ هَذَا عَدُوٌّ لَكَ وَلِزَوْجِكَ فَلَا يُخْرِجَنَّكُمَا مِنَ الْجَنَّةِ فَتَشْقَى ﴿١١٧﴾﴾ (طه)

«So, We said, “O Adam, indeed this is an enemy to you and to your wife. Then let him not remove you from Paradise so you would suffer (117)» (Ta-ha);

Iblis and his progeny have been given permission by Allah (SWT) to attempt to influence humans, applying all their possible ways, including the allurements of worldly life (wealth, children), in order to sway them from the Straight Path. All this happened in a dramatic encounter between Allah (SWT) and Iblis as the following verses state:

﴿وَإِذْ قُلْنَا لِلْمَلَائِكَةِ اسْجُدُوا لِآدَمَ فَسَجَدُوا إِلَّا إِبْلِيسَ قَالَ أَأَسْجُدُ لِمَنْ خَلَقْتُ طِينًا ﴿٦١﴾﴾ ﴿قَالَ أَرَأَيْتَكَ هَذَا الَّذِي كَرَّمْتَ عَلَيَّ لَئِنِ أَحْرَقْتَنِي إِلَى يَوْمِ الْقِيَامَةِ لِأَخْتَبِكُنَّ ذُرِّيَّتَهُ إِلَّا قَلِيلًا ﴿٦٢﴾﴾ ﴿قَالَ أَذْهَبَ فَمَنْ تَبِعَكَ مِنْهُمْ فَإِنَّ جَهَنَّمَ جَزَاؤُكُمْ جَزَاءً مَوْفُورًا ﴿٦٣﴾﴾ ﴿وَاسْتَفْرَزَ مَنْ اسْتَطَاعَ مِنْهُمْ بِصَوْتِكَ وَأَجْلِبْ عَلَيْهِمْ بِخَيْلِكَ وَرَجِلِكَ وَشَارِكُكُمْ فِي الْأَمْوَالِ وَالْأَوْلَادِ وَعِدَّهُمْ وَإِنَّمَا وَعْدُهُمْ الشَّيْطَانُ إِلَّا غُرُورًا ﴿٦٤﴾﴾ (الإسراء)

«And [mention] when We said to the angles, «Prostrate to Adam,» and they prostrated, except for Iblees. He said, «Should I prostrate to one You created from clay?»(61) [Iblees] said, “Do You see this one whom You have honored above me? If You delay me until the Day of Resurrection, I will surely destroy his descendants, except for a few.”(62) [Allah] said, “Go, for whoever of them follows you, indeed Hell will be the recompense of you - an ample recompense (63) And incite [to senselessness] whoever you can among them with your voice and assault them with your horses and foot soldiers and become a partner in their wealth and their children and promise them.” But Satan does not promise them except delusion (64)» (Israel).

This last verse alone mentions four effective mechanisms which Satan employs against humans: *incitement with voice; assault with Satan's horses and foot soldiers; partnership in wealth and children; delusive promises*. Given our assumption of no revelation, no person in the natural social system can avoid the destructive effects of these satanic mechanisms. In the day of recompense no one will be excused for succumbing to these satanic delusions, except those to whom a prophet has not been sent, because humans have been equipped with countering mechanisms:

﴿وَقَالَ الشَّيْطَانُ لَمَّا قُضِيَ الْأَمْرُ إِنَّ اللَّهَ وَعَدَكُمْ وَعَدَ الْحَقُّ وَوَعَدْتُكُمْ فَأَخْلَفْتُكُمْ وَمَا كَانَ لِي عَلَيْكُمْ مِنْ سُلْطَانٍ إِلَّا أَنْ دَعَوْتُكُمْ فَاسْتَجَبْتُمْ لِي فَلَا تَلُمُونِي وَلُومُوا أَنْفُسَكُمْ مَا أَنَا بِمُصْرِخِكُمْ وَمَا أَنْتُمْ بِمُصْرِخِي إِيَّيْكُمْ بِمَا أَشْرَكْتُمُونِ مِنْ قَبْلُ إِنَّ الظَّالِمِينَ لَهُمْ عَذَابٌ أَلِيمٌ ﴿٢٢﴾﴾ (إبراهيم)

«And Satan will say when the matter has been concluded, «Indeed, Allah had promised you the promise of truth. And I promised you, but I betrayed you. But I had no authority over you except that I invited you, and you responded to me. So do not blame me; but blame yourselves. I cannot be called to your aid, nor can you be called to my aid. Indeed, I deny your association of me [with Allah] before. Indeed, for the wrongdoers is a painful punishment.»(22)» (Ibrahim).

These Satanic mechanisms augment those internal ones that work to dismantle the natural social system. Though these satanic mechanisms may never lend themselves to direct scientific investigation, however, the authority of the Holy Qur`an as a source of apodictic knowledge is sufficient for Muslim scholars to take them in consideration when studying human social systems. They work through human whims and love for the lust and propagation of wealth and children, where Satan makes attractive to them their actions:

﴿ فَلَوْلَا إِذْ جَاءَهُمْ بَأْسُنَا تَضَرَّعُوا وَلَكِنْ قَسَتْ قُلُوبُهُمْ وَزَيَّنَ لَهُمُ الشَّيْطَانُ مَا كَانُوا يَعْمَلُونَ ٤٣ ﴾ (الأنعام)

«Then why, when Our punishment came to them, did they not humble themselves? But their hearts became hardened, and Satan made attractive to them that which they were doing (43)» (Al-An'am)

These actions, which are made attractive by Satan, in their systemic feedback effects, corrupt the human heart, thereby strengthen the transgressing properties in the self system, which in turn harden the heart and weaken the effects of those properties acquired from the soul system. The result is a spiritually sick human self, which paves the way for the dominance of those mechanisms grounded on “love for lust” and “love for competition in increase” in wealth and children. This chain of processes may ultimately climax in the dismantling of the natural social system.

The operating mechanisms in the direct relationship between Allah (SWT) and the natural social system via its components, environment and structure are those of *mercy* and *compassion* because, firstly, He has not sent a messenger to the people of this natural social system and said He will not punish until He send a messenger. Secondly, because He said that his general relationship with all humans, irrespective of their belief, is that of kindness and mercy, which does not entail divine guidance to the straight path:

﴿ أَلَمْ تَرَ أَنَّ اللَّهَ سَخَّرَ لَكُمْ مَا فِي الْأَرْضِ وَأَلْفَلَّتْ تَجْرِي فِي الْبَحْرِ بِأَمْرِهِ وَيُمْسِكُ السَّمَاءَ أَنْ تَقَعَ عَلَى الْأَرْضِ إِلَّا بِإِذْنِهِ إِنَّ اللَّهَ بِالنَّاسِ لَرَءُوفٌ رَحِيمٌ ٦٥ ﴾ (الحج)

«Do you not see that Allah has subjected to you whatever is on the earth and the ships which run through the sea by His command? And He restrains the sky from falling upon the earth, unless by His permission. Indeed Allah, to the people, is Kind and Merciful (65)» (Al-Hajj).

The divine processes of *kindness* and *mercy* are subtle and infinite. Allah (SWT) knows them:

﴿ وَإِنْ تَعُدُّوا نِعْمَةَ اللَّهِ لَا تُحْصُوهَا إِنَّ اللَّهَ لَغَفُورٌ رَحِيمٌ ١٨ ﴾ (النحل)

«And if you should count the favors of Allah, you could not enumerate them. Indeed, Allah is Forgiving and Merciful (18)» (An-Nahl).

One pathway of these divine mechanisms is that of *subjugation*(تسخير)

﴿ وَسَخَّرَ لَكُمْ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ جَمِيعًا مِنْهُ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يُتَفَكَّرُونَ ١٣ ﴾ (الجنانية)

«And He has subjected to you whatever is in the heavens and whatever is on the earth - all from Him. Indeed in that are signs for a people who give thought (13)» (Al-Jathiya).

Another pathway of these divine mechanisms is that of *enablement* (تمكين)

﴿ وَلَقَدْ مَكَّنَّاكُمْ فِي الْأَرْضِ وَجَعَلْنَا لَكُمْ فِيهَا مَعَايِشَ قَلِيلًا مَا تَشْكُرُونَ ١٠ ﴾ (الأعراف)

«And We have certainly established you upon the earth and made for you therein ways of livelihood. Little are you grateful (10)» (Al-A'raf).

As mentioned above there is an indirect relationship between Allah (SWT) and the people in this natural social system based on the mechanisms of the ways of Allah (SWT) (سنن) which act like social laws in the social domain of reality. I have already said enough about this relationship a few pages back where I gave my own definition for this external mechanism.

Thus, we arrive at the conclusion with which we started this section that in the absence of divine guidance, brought down by Allah (SWT) via his messengers,

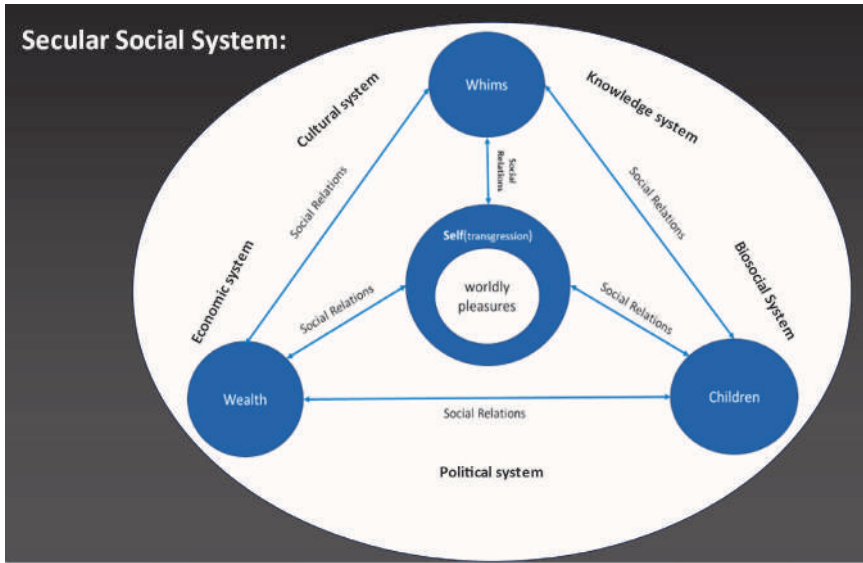
human conditions in this natural social system will always be perilous due to the dominance of the mechanisms of transgression, internal and external, with dismantling effects on the social system. Hence, sending messengers is a mercy from Allah (SWT) on human beings. Rejecting or accepting the divine message represents a milestone in the evolution of the particular social system and in the development of its human agents.

4- The Secular Social System

This social system is depicted in Fig. 4 below and represents one of the limits of the natural social system. It is grounded on the assumption that Allah (SWT) has sent messengers with his Revelation to the people of the natural social system but they deliberately rejected the message and messengers and chose a secular alternative in which this worldly life and its allurements of wealth and children is preferred to the life of the *Akhira*. The latter alternative constrains human choices and actions in this world. Thus, in contradistinction with the natural social system, this secular social system is a created system and designed to achieve certain goals in the worldly life. Knowledge, theoretical, empirical, positive, and normative will be used in designing and controlling the secular social system. This is the reason for me separating the knowledge system from the cultural system and giving it an independent status as Fig. 4 shows. The seedling of this knowledge is likely to be the cognitive challenge of the apodictic knowledge brought down by revelation, the message of which addresses the cognitive, emotive, volitional, and practical domains of the human self. The revealed knowledge is about Allah (SWT), the Creator of man and the cosmos, and about the signs of creation in man and the cosmos as evidence of the existence of the Allah (SWT). Such kind of challenging knowledge may awaken the otherwise dormant cognitive faculties of the agents of the natural social system.

We will explore the secular social system by first stating its ontological, epistemological, and methodological characteristics deduced from the Holy Qur`an, then we use these characteristics to study its systemic aspects.

Fig. 4: Secular Social System



From the Holy Qur`an we can affirm the following characteristics of this secular social system:

1 - The choice of this worldly life over the life in the hereafter as the following verses imply:

﴿ بَلْ تُؤْتُونَ الْحَيَاةَ الدُّنْيَا ١٦ وَالْآخِرَةَ خَيْرٌ وَأَبْقَى ١٧ ﴾ (الأعلى)

«But you prefer the worldly life (16) While the Hereafter is better and more enduring (17)» (Al-A'la);

﴿ فَأَعْرِضْ عَنْ مَنْ تَوَلَّى عَنْ ذِكْرِنَا وَلَمْ يُرِدْ إِلَّا الْحَيَاةَ الدُّنْيَا ٢٩ ﴾ (النجم)

«So turn away from whoever turns his back on Our message and desires not except the worldly life (29)» (An-Najm);

﴿ مَنْ كَانَ يُرِيدُ الْحَيَاةَ الدُّنْيَا وَزِينَتَهَا نُوفِيَ إِلَيْهِمْ أَعْمَالَهُمْ فِيهَا وَهُمْ فِيهَا لَا يُبْخَسُونَ ١٥ ﴾ (هود)

«Whoever desires the life of this world and its adornments - We fully repay them for

their deeds therein, and they therein will not be deprived (15)» (Hud).

2 - maximization of worldly pleasures as the ultimate goal of life for the actors of the system as the following verses imply:

﴿ اَعْلَمُوا أَنَّمَا الْحَيَاةُ الدُّنْيَا لَعِبٌ وَلَهُمْ زِينَةٌ وَتَفَاخُرٌ بَيْنَكُمْ وَتَكَاثُرٌ فِي الْأَمْوَالِ وَالْأَوْلَادِ كَمَثَلِ غَيْثٍ أَعْجَبَ الْكُفَّارَ نَبَاتُهُ ثُمَّ يَهْبِجُ فَتَرَاهُ مُصْفَرًّا ثُمَّ يَكُونُ حُطَامًا وَفِي الْآخِرَةِ عَذَابٌ شَدِيدٌ وَمَغْفِرَةٌ مِنَ اللَّهِ وَرِضْوَانٌ وَمَا الْحَيَاةُ الدُّنْيَا إِلَّا مَتَاعُ الْغُرُورِ ﴿٢٠﴾
(الحديد)

«Know that the life of this world is but amusement and diversion and adornment and boasting to one another and competition in increase of wealth and children - like the example of a rain whose [resulting] plant growth pleases the tillers; then it dries and you see it turned yellow; then it becomes [scattered] debris. And in the Hereafter is severe punishment and forgiveness from Allah and approval. And what is the worldly life except the enjoyment of delusion (20)» (Al-Hadid);

﴿... وَالَّذِينَ كَفَرُوا يَتَمَتَّعُونَ وَيَأْكُلُونَ كَمَا تَأْكُلُ الْأَنْعَامُ وَالنَّارُ مَثْوًى لَهُمْ ۗ﴾ (محمد)

«...but those who disbelieve enjoy themselves and eat as grazing livestock eat, and the Fire will be a residence for them (12)» (Muhammad).

3 - Sensory knowledge is all that the agents have about reality as the following verses imply:

﴿ يَعْلَمُونَ ظَاهِرًا مِّنَ الْحَيَاةِ الدُّنْيَا وَهُمْ عَنِ الْآخِرَةِ هُمْ غَافِلُونَ ۗ﴾ (الروم)

«They know what is apparent of the worldly life, but they, of the Hereafter, are unaware (7)» (Ar-Rum);

﴿ فَأَعْرِضْ عَنْ مَن تَوَلَّىٰ عَنْ ذِكْرِنَا وَلَمْ يُرِدْ إِلَّا الْحَيَاةَ الدُّنْيَا ۗ ٢٩ ذَٰلِكَ مَبْلَعُهُمْ مِّنَ الْعِلْمِ إِنَّ رَبَّكَ هُوَ أَعْلَمُ بِمَن ضَلَّ عَن سَبِيلِهِ وَهُوَ أَعْلَمُ بِمَن اهْتَدَىٰ ۗ﴾ (النجم)

«So turn away from whoever turns his back on Our message and desires not except the worldly life(29) That is their sum of knowledge. Indeed, your Lord is most knowing of who strays from His way, and He is most knowing of who is guided (30)» (An-Najm).

4 - Deeds done by the agents of the system will get their due rewards in this

world but not in the hereafter as the following verses imply:

﴿مَنْ كَانَ يُرِيدُ الْحَيَاةَ الدُّنْيَا وَزِينَتَهَا نُوَفِّ إِلَيْهِمْ أَعْمَالَهُمْ فِيهَا وَهُمْ فِيهَا لَا يُبْخَسُونَ ١٥﴾ ﴿أُولَئِكَ الَّذِينَ لَيْسَ لَهُمْ فِي الْآخِرَةِ إِلَّا النَّارُ وَخَبِطَ مَا صَنَعُوا فِيهَا وَبِاطِلٌ مَا كَانُوا يَعْمَلُونَ ١٦﴾ (هود)

«Whoever desires the life of this world and its adornments - We fully repay them for their deeds therein, and they therein will not be deprived (15) Those are the ones for whom there is not in the Hereafter but the Fire. And lost is what they did therein, and worthless is what they used to do (16)» (Hud);

5- Corruption on earth and the severance of kinship ties will be the end result of the secular social system, as the following verses imply:

﴿فَهَلْ عَسَيْتُمْ إِنْ تَوَلَّيْتُمْ أَنْ تُفْسِدُوا فِي الْأَرْضِ وَتُقَطِّعُوا أَرْحَامَكُمْ ٢٢﴾ (محمد)

«So, would you perhaps, if you turned away, cause corruption on earth and sever your [ties of] relationship? (22)» (Muhammad);

﴿ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُمْ بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ ٤١﴾ (الروم)

«Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so He may let them taste part of [the consequence of] what they have done that perhaps they will return [to righteousness] (41)» (al-Rum).

4.1- Components of the Secular Social System

The secular social system is composed of human agents defined by the above five characteristics deduced from the Holy Qur'an. Their worldview is determined by the observable world alone; maximization of worldly pleasures is their sole goal in life; sensory knowledge is their means to achieving their goals and transgression properties of the self are the inspiring psychological force that furnish their actions and interactions.

4.2- Environment of the Secular Social System

The environment of the system consists of the components of the observable world and those of the unobservable world; then there is Allah (SWT), the all-encompassing Creator (Fig. 3). We draw the attention of the reader to the fact

that though wealth and children are part of the environment of the human system, they are not in the social system because they are macro aspects of the social system. Revelation enters as a component in the environment of the observable world in the secular social system because we have assumed that it has been brought down by Allah (SWT) via His messengers, but the agents of the secular social system rejected the message of Allah (SWT). However, rejection of the divine message does not make Revelation disappear but will always remain and take different forms of existence and expressions.

4.3- Structure of the Secular Social System

The structure of the secular social system consists of the endostructure-collection of social relations- between the components of the system and exostructure between these components and those of the external environment. The external environment of the system spans three levels: the observable world (earth, Revelation, cosmos), the unobservable world (Angels, Jinn) and the relationship with Allah (SWT). The secular social system is grounded on the following assumptions:

- a) Messengers of Allah (SWT) were sent with revealed divine knowledge the message of which is that of Tawhid at the personal and social levels of life,
- b) The actors of the secular social system rejected the message of Allah (SWT) and opted for a secular social system governed by whims as their alternative god:

﴿ أَفَرَأَيْتَ مَنِ اتَّخَذَ إِلَهَهُ هَوَاهُ وَأَضَلَّهُ اللَّهُ عَلَىٰ عِلْمِهِ وَخَتَمَ عَلَىٰ سَمْعِهِ وَقَلْبِهِ وَجَعَلَ عَلَىٰ بَصَرِهِ غِشَاوَةً فَمَنْ يَهْدِيهِ مِنْ بَعْدِ ۗ اللَّهُ أَفَلَا تَتَذَكَّرُونَ ۚ ﴾ ٢٣ ﴿ وَقَالُوا مَا هِيَ إِلَّا حَيَاتُنَا الدُّنْيَا نَمُوتُ وَنَحْيَا وَمَا يُهْلِكُنَا إِلَّا الدَّهْرُ وَمَا لَهُمْ بِذَلِكَ مِنْ عِلْمٍ إِنْ هُمْ إِلَّا يَظُنُّونَ ۚ ﴾ ٢٤ ﴿ (الجاثية)

«Have you seen he who has taken as his god his [own] desire, and Allah has sent him astray due to knowledge and has set a seal upon his hearing and his heart and put over his vision a veil? So, who will guide him after Allah? Then will you not be reminded? (23) And they say, “There is not but our worldly life; we die and live, and nothing destroys us except time.” And they have of that no knowledge; they are only assuming (24)» (Al-Jathiya).

These two propositions make all the difference in the way we approach the

analysis of the secular social system compared to the natural social system. Accepting the message of Tawhid and choosing to establish a Tawhidi social system, or rejecting the message and choosing the secular alternative results in a definite relationship with Allah (SWT) which redefines the entire social system in terms of its constituents, environment, structure and mechanisms. In the Holy Qur`an Allah (SWT) stated clearly the ideal social equation according to which the social system should be organized:

﴿ إِنَّ اللَّهَ يَأْمُرُ بِالْعَدْلِ وَالْإِحْسَانِ وَإِيتَاءِ ذِي الْقُرْبَىٰ وَيَنْهَىٰ عَنِ الْفَحْشَاءِ وَالْمُنْكَرِ وَالْبَغْيِ يُعْطِكُمْ لَعَلَّكُمْ تَذَكَّرُونَ ٩٠ ﴾
(النحل)

«Indeed, Allah orders justice and good conduct and giving to relatives and forbids immorality and bad conduct and oppression. He admonishes you that perhaps you will be reminded (90)» (An-Nahl).

These normative organizing principles of divine dos and don'ts are the only ones, if adhered to by actors, that enable any human social system to achieve a long run self-organization. But adherence to these organizing principles is possible only when the actors believe in Allah SWT and commit themselves to establish their social system accordingly. The secular social system, by rejecting the divine message, is grounding itself in *immorality*, *wrongdoing* and *oppression* and above all *enmity* to almighty Allah (SWT). This *ideal type* secular social system is described in all its aspects by the following verses:

﴿ مَنْ كَانَ عَدُوًّا لِلَّهِ وَمَلَائِكَتِهِ وَرُسُلِهِ وَجِبْرِيلَ وَمِيكَالَ فَإِنَّ اللَّهَ عَدُوٌّ لِلْكَافِرِينَ ٩٨ ﴾ (البقرة)

«Whoever is an enemy to Allah and His angels and His messengers and Gabriel and Michael - then indeed, Allah is an enemy to the disbelievers (98)» (Al-Baqara);

﴿ قَهَلْ عَسَيْتُمْ إِنْ تَوَلَّيْتُمْ أَنْ تُفْسِدُوا فِي الْأَرْضِ وَتُقَطِّعُوا أَرْحَامَكُمْ ٢٢ ﴾ (محمد)

«So would you perhaps, if you turned away, cause corruption on earth and sever your [ties of] relationship? (22)» (Muhammad);

﴿ فَلَا تُعْجِبْكَ أَمْوَالُهُمْ وَلَا أَوْلَادُهُمْ إِنَّمَا يُرِيدُ اللَّهُ لِيُعَذِّبَهُمْ بِهَا فِي الْحَيَاةِ الدُّنْيَا وَتَرْهَقَ أَنْفُسُهُمْ وَهُمْ كَافِرُونَ ٥٥ ﴾ (التوبة)

«So let not their wealth or their children impress you. Allah only intends to punish them through them in worldly life and that their souls should depart [at death] while

they are disbelievers (55)» (At-Tauba);

﴿ أَيَحْسَبُونَ أَنَّمَا نُمِدُّهُمْ بِهِ مِنْ مَّالٍ وَبَنِينَ ﴿٥٥﴾ ﴿ نَسَارِعُ لَهُمْ فِي الْخَيْرَاتِ بَلْ لَا يَشْعُرُونَ ﴿٥٦﴾ (المؤمنون)

«Do they think that what We extend to them of wealth and children (55) Is [because] We hasten for them good things? Rather, they do not perceive (56)» (Al-Muminun)

﴿...وَالَّذِينَ كَفَرُوا يَتَمَتَّعُونَ وَيَأْكُلُونَ كَمَا تَأْكُلُ الْأَنْعَامُ وَالنَّارُ مَثْوًى لَهُمْ ﴿١٢﴾ (محمد)

«..... but those who disbelieve enjoy themselves and eat as grazing livestock eat, and the Fire will be a residence for them(12)» (Muhammad);

﴿ وَإِذَا تَوَلَّى سَعَى فِي الْأَرْضِ لِيُفْسِدَ فِيهَا وَيُهْلِكَ الْحَرْثَ وَالنَّسْلَ وَاللَّهُ لَا يُحِبُّ الْفُسَادَ ﴿٢٠٥﴾ (البقرة)

«And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption (205)» (Al-Baqara);

﴿ وَمَنْ أَعْرَضَ عَنْ ذِكْرِي فَإِنَّ لَهُ مَعِيشَةً ضَنْكًا وَنَحْشُرُهُ يَوْمَ الْقِيَامَةِ أَعْيى ﴿١٢٤﴾ (طه)

«And whoever turns away from My remembrance - indeed, he will have a depressed life, and We will gather him on the Day of Resurrection blind.» (124)» (Ta-ha);

﴿ تَاللَّهِ لَقَدْ أَرْسَلْنَا إِلَىٰ أُمَمٍ مِنْ قَبْلِكَ فَرَىٰ لَهُمُ الشَّيْطَانُ أَعْمَالَهُمْ فَهَوَىٰ وِلْيَتَهُمُ الْيَوْمَ وَلَهُمْ عَذَابٌ أَلِيمٌ ﴿٦٣﴾ (النحل)

«By Allah, We did certainly send [messengers] to nations before you, but Satan made their deeds attractive to them. And he is the disbelievers' ally today [as well], and they will have a painful punishment (63)» (An-Nahl);

﴿ لَقَدْ كَانَ لِسَبَإٍ فِي مَسْكَنِهِمْ آيَةٌ جَنَّتَانِ عَنْ يَمِينٍ وَشِمَالٍ كُلُوا مِنْ رِزْقِ رَبِّكُمْ وَاشْكُرُوا لَهُ بَلْدَةٌ طَيِّبَةٌ وَرَبٌّ غَفُورٌ ﴿١٥﴾ ﴿ فَأَعْرَضُوا فَأَرْسَلْنَا عَلَيْهِمْ سَيْلَ الْعَرِمِ وَبَدَّلْنَاهُمْ بِجَنَّتَيْهِمْ جَنَّتَيْنِ ذَوَاتِي أُكُلٍ خَمْطٍ وَأَثْلٍ وَشَيْءٍ مِنْ سِدْرٍ قَلِيلٍ ﴿١٦﴾ ﴿ ذَلِكَ جَزَيْنَاهُمْ بِمَا كَفَرُوا وَهَلْ نُجَازِي إِلَّا الْكَافِرَ ﴿١٧﴾ ﴿ وَجَعَلْنَا بَيْنَهُمْ وَبَيْنَ الْفُرَّىٰ الَّتِي بَارَكْنَا فِيهَا فُرىٰ ظَاهِرَةٌ وَقَدْ رَزَقْنَا فِيهَا الْمَسِيرَ سِيرُوا فِيهَا لِيَالِيٍّ وَأَيَّامًا آمِينَ ﴿١٨﴾ ﴿ فَقَالُوا رَبَّنَا بَاعِدْ بَيْنَ أَسْفَارِنَا وَظَلَمُوا أَنفُسَهُمْ فَجَعَلْنَا لَهُمْ أَحَادِيثَ وَمَرَفَاتٍ كَلَّا مُعْرِقٍ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِكُلِّ صَبَّارٍ شَكُورٍ ﴿١٩﴾ ﴿ وَلَقَدْ صَدَّقَ عَلَيْهِمْ إِبْلِيسُ ظَنَّهُ فَاتَّبَعُوهُ إِلَّا فَرِيقًا مِنَ الْمُؤْمِنِينَ ﴿٢٠﴾ (سبا)

«There was for [the tribe of] Saba in their dwelling place a sign: two [fields of] gardens on the right and on the left. [They were told], «Eat from the provisions of your Lord and be grateful to Him. A good land [have you], and a forgiving Lord.»(15) But they turned away [refusing], so We sent upon them the flood of the dam, and We replaced their two [fields of] gardens with gardens of bitter fruit, tamarisks and something of

sparse lote trees (16 [By] that We repaid them because they disbelieved. And do We [thus] repay except the ungrateful? (17) And We placed between them and the cities which We had blessed [many] visible cities. And We determined between them the [distances of] journey, [saying], "Travel between them by night or day in safety." (18) But [insolently] they said, "Our Lord, lengthen the distance between our journeys," and wronged themselves, so We made them narrations and dispersed them in total dispersion. Indeed in that are signs for everyone patient and grateful (19) And Iblees had already confirmed through them his assumption, so they followed him, except for a party of believers (20)» [Saba: 15-20];

﴿ أَفَرَأَيْتَ مَنْ اتَّخَذَ إِلَهَهُ هَوَاهُ وَأَضَلَّهُ اللَّهُ عَلَىٰ عِلْمٍ وَخَتَمَ عَلَىٰ سَمْعِهِ وَقَلْبِهِ وَجَعَلَ عَلَىٰ بَصَرِهِ غِشَاوَةً فَمَنْ يَهْدِيهِ مِنْ بَعْدِ اللَّهِ أَفَلَا تَذَكَّرُونَ ۚ ۲۳ ﴾ (الجاثية)

«Have you seen he who has taken as his god his [own] desire, and Allah has sent him astray due to knowledge and has set a seal upon his hearing and his heart and put over his vision a veil? So, who will guide him after Allah? Then will you not be reminded? (23)» (Al-Jathiya);

﴿ أَفَمَنْ كَانَ عَلَىٰ بَيِّنَةٍ مِنْ رَبِّهِ كَمَنْ زُيِّنَ لَهُ سُوءُ عَمَلِهِ وَاتَّبَعُوا أَهْوَاءَهُمْ ۚ ۱۴ ﴾ (محمد)

«So is he who is on clear evidence from his Lord like him to whom the evil of his work has been made attractive and they follow their [own] desires? (14)» (Muhammad);

﴿ اعْلَمُوا أَنَّمَا الْحَيَاةُ الدُّنْيَا لَعِبٌ وَلَهُمْ زِينَةٌ وَتَفَاخُرٌ بَيْنَكُمْ وَتَكَاثُرٌ فِي الْأَمْوَالِ وَالْأَوْلَادِ كَمَثَلِ غَيْثٍ أَعْجَبَ الْكُفَّارَ نَبَاتُهُ ثُمَّ يَهِيجُ فَتَرَاهُ مُصْفَرًّا ثُمَّ يَكُونُ حُطَامًا وَفِي الْآخِرَةِ عَذَابٌ شَدِيدٌ وَمَغْفِرَةٌ مِنَ اللَّهِ وَرِضْوَانٌ وَمَا الْحَيَاةُ الدُّنْيَا إِلَّا مَتَاعُ الْغُرُورِ ۚ ۲۰ ﴾ (الحديد)

«Know that the life of this world is but amusement and diversion and adornment and boasting to one another and competition in increase of wealth and children - like the example of a rain whose [resulting] plant growth pleases the tillers; then it dries and you see it turned yellow; then it becomes [scattered] debris. And in the Hereafter is severe punishment and forgiveness from Allah and approval. And what is the worldly life except the enjoyment of delusion (20)» (Al-Hadid).

The content of these verses disciplines our analysis of the endo and exo structures of the secular social system. The internal structure binds the agents of the system primarily in the two domains of wealth and children and any other aspects of the system generated by actions and interactions in these two

primary domains of the social system. The most characteristic features of these social relations are to facilitate moral corruption, wrongdoing and aggression in the domains of wealth and children and the spillover of such relations to the cultural and political domains. I will not expand here on the specific forms such characteristics take, e.g., usury in the economic domain, prostitution, cohabitation, tribalism, clannishness...etc., in the kinship domain, struggle for power and partisanship in the political domain and immorality and atheism in the cultural domain. These social relations and the commons the secular system is expected to generate for the actors represent the secular limit of the natural social system as discussed in that system above. The reader is referred to that discussion.

The external relations of the secular social system are those between its components and the components of its environment in the observable world (earth, cosmos, Revelation) and in the unobservable world (Angels, Jinn) and with Allah (SWT). The bonding relations between the human agents of the secular social system and the material observable world (earth, cosmos) is that of corruption because it is based on purely material exploitation in order to satisfy the objective of maximizing worldly pleasures. The relations with Revelation are not bonding relations because of the deliberate rejection by the agents for the divine message.

The most important bonding relations with the invisible world are those with Satan- Iblis and progeny- as can be deduced from the following verses:

﴿ يَا بَنِي آدَمَ لَا يَفْتِنَنَّكُمُ الشَّيْطَانُ كَمَا أَخْرَجَ أَبَوَيْكُم مِّنَ الْجَنَّةِ يَنزِعُ عَنْهُمَا لِبَاسَهُمَا لِيُرِيَهُمَا سَوْآتِهِمَا إِنَّهُ يَرَاكُمْ هُوَ وَقَبِيلُهُ مَن حَيْثُ لَا تَرَوُهُمْ إِنَّ جَعَلْنَا الشَّيَاطِينَ أَوْلِيَاءَ لِلَّذِينَ لَا يُؤْمِنُونَ ﴿٢٧﴾ (الأعراف)

«O children of Adam, let not Satan tempt you as he removed your parents from Paradise, stripping them of their clothing to show them their private parts. Indeed, he sees you, he and his tribe, from where you do not see them. Indeed, We have made the devils allies to those who do not believe (27)» (Al-A'raf);

﴿ إِنَّ يَدْعُونَ مِن دُونِهِ إِلَّا إِنَانَا وَإِن يَدْعُونَ إِلَّا شَيْطَانًا مَّرِيدًا ﴿١١٧﴾ ﴿ لَعَنَهُ اللَّهُ وَقَالَ لَأَتَّخِذَنَّ مِنْ عِبَادِكَ نَصِيبًا مَّفْرُوضًا ﴿١١٨﴾ ﴿ وَتَضَلَّتْهُمُ وَالْمَآئِيَّتُهُمْ وَآمَرْتَهُمْ فَلْيَبْتَئِكُنَّ آذَانَ الْأَنْعَامِ وَآمَرْتَهُمْ فَلْيَغْوِينَ خَلْقَ اللَّهِ وَمَن يَتَّخِذِ الشَّيْطَانَ وَلِيًّا مِّن دُونِ اللَّهِ فَقَدْ خَسِرَ خُسْرَانًا مُّبِينًا ﴿١١٩﴾ ﴿ يَعْبُدُهُمْ وَيُمْتَتِيهِمْ وَمَا يَعْبُدُهُمُ الشَّيْطَانُ إِلَّا عُرْوًا ﴿١٢٠﴾ (النساء)

«They call upon instead of Him none but female [deities], and they [actually] call

upon none but a rebellious Satan (117) Whom Allah has cursed. For he had said, "I will surely take from among Your servants a specific portion (118) And I will mislead them, and I will arouse in them [sinful] desires, and I will command them so they will slit the ears of cattle, and I will command them so they will change the creation of Allah." And whoever takes Satan as an ally instead of Allah has certainly sustained a clear loss (119) Satan promises them and arouses desire in them. But Satan does not promise them except delusion (120)» (An-Nisaa);

﴿سَتَجِدُوا كَثِيرًا مِّنَ الشَّيْطَانِ فَآتَسَاهُمْ ذِكْرَ اللَّهِ أُولَئِكَ حِزْبُ الشَّيْطَانِ أَلَا إِنَّ حِزْبَ الشَّيْطَانِ هُمُ الْخَاسِرُونَ ١٩﴾
(المجادلة)

«Satan has overcome them and made them forget the remembrance of Allah. Those are the party of Satan. Unquestionably, the party of Satan - they will be the losers (19)» (Al-Mujadila);

﴿وَمَنْ يَعْشُ عَنْ ذِكْرِ الرَّحْمَنِ نُقَيِّضْ لَهُ شَيْطَانًا فَهُوَ لَهُ قَرِينٌ ٣٦﴾ ﴿وَإِنَّهُمْ لَيَصُدُّونَهُمْ عَنِ السَّبِيلِ وَيَحْسَبُونَ أَنَّهُمْ مُّهْتَدُونَ ٣٧﴾ (الزخرف)

«And whoever is blinded from remembrance of the Most Merciful - We appoint for him a devil, and he is to him a companion (36) And indeed, the devils avert them from the way [of guidance] while they think that they are [rightly] guided (37)» (Az-Zukhruf);

﴿وَأَنَّهُ كَانَ رِجَالٌ مِّنَ الْإِنْسِ يَعُوذُونَ بِرِجَالٍ مِّنَ الْجِنِّ فَزَادُوهُمْ رَهَقًا ٦﴾ (الجن)

«And there were men from mankind who sought refuge in men from the jinn, so they [only] increased them in burden (6)» (Al-Jinn);

﴿قَالُوا سُبْحَانَكَ أَنْتَ وَلِيِّنَا مِنْ دُونِهِمْ بَلْ كَانُوا يَعْبُدُونَ الْجِنَّ أَكْثَرَهُمْ بِهِمْ مُؤْمِنُونَ ٤١﴾ (سبا)

«They will say, «Exalted are You! You, [O Allah], are our benefactor not them. Rather, they used to worship the jinn; most of them were believers in them.»(41)» (Saba);

﴿وَيَوْمَ يَحْشُرُهُمْ جَمِيعًا يَا مَعْشَرَ الْجِنِّ قَدِ اسْتَكْبَرْتُمْ مِنَ الْإِنْسِ وَقَالَ أَوْلِيَاؤُهُمْ مِنَ الْإِنْسِ رَبَّنَا اسْتَمْتَعَ بَعْضُنَا بِبَعْضٍ وَبَلَّغْنَا أَجَلَنَا الَّذِي أَجَلْتَنَا لَنَا قَالَ النَّارُ مَثْوَاكُمْ خَالِدِينَ فِيهَا إِلَّا مَا شَاءَ اللَّهُ إِنَّ رَبَّكَ حَكِيمٌ عَلِيمٌ ١٢٨﴾ ﴿وَكَذَلِكَ نُؤَيِّنُ بَعْضَ الظَّالِمِينَ بَعْضًا بِمَا كَانُوا يَكْسِبُونَ ١٢٩﴾ (الأنعام)

«And [mention, O Muhammad], the Day when He will gather them together [and say], «O company of jinn, you have [misled] many of mankind.» And their allies

among mankind will say, «Our Lord, some of us made use of others, and we have [now] reached our term, which you appointed for us.» He will say, «The Fire is your residence, wherein you will abide eternally, except for what Allah wills. Indeed, your Lord is Wise and Knowing.»(128) And thus will We make some of the wrongdoers allies of others for what they used to earn (129)» (Al-An'am).

The verses show that the bonding relations with *Satan* are those of “alliance” from the part of the agents of the secular social system and of “possession” from the part of Satan with “companionship” serving as a unifying umbrella for both bonding relationships.

The bonding relations between Allah (SWT) and the agents of the secular system can be deduced from the following verses:

﴿مَنْ كَانَ عَدُوًّا لِلَّهِ وَمَلَائِكَتِهِ وَرُسُلِهِ وَجِبْرِيلَ وَمِيكَالَ فَإِنَّ اللَّهَ عَدُوٌّ لِلْكَافِرِينَ ٩٨﴾ (البقرة)

«Whoever is an enemy to Allah and His angels and His messengers and Gabriel and Michael - then indeed, Allah is an enemy to the disbelievers (98)» (Al-Baqara);

﴿وَإِذْ يَمْكُرُ بِكَ الَّذِينَ كَفَرُوا لِيُثْبِتُوكَ أَوْ يَقْتُلُوكَ أَوْ يُخْرِجُوكَ وَيَمْكُرُونَ وَيَمْكُرُ اللَّهُ وَاللَّهُ خَيْرٌ الْمَأْمُرِينَ ٣٠﴾ (الأنفال)

«And [remember, O Muhammad], when those who disbelieved plotted against you to restrain you or kill you or evict you [from Makkah]. But they plan, and Allah plans. And Allah is the best of planners (30)» (Al-Anfal);

﴿وَإِذَا أَذَقْنَا النَّاسَ رَحْمَةً مِنْ بَعْدِ ضَرَاءٍ مَسَّتْهُمْ إِذَا لَهُمْ مَكْرٌ فِي آيَاتِنَا قُلِ اللَّهُ أَسْرَعُ مَكْرًا إِنَّ رُسُلَنَا يَكْتُوبُونَ مَا تَمْكُرُونَ ٢١﴾ (يونس)

«And when We give the people a taste of mercy after adversity has touched them, at once they conspire against Our verses. Say, «Allah is swifter in strategy.» Indeed, Our messengers record that which you conspire (21)» (Yunus);

﴿وَالَّذِينَ يَمْكُرُونَ السَّيِّئَاتِ لَهُمْ عَذَابٌ شَدِيدٌ وَمَكْرُ أُولَئِكَ هُوَ يُبْورُ ١٠﴾ (فاطر)

«... But they who plot evil deeds will have a severe punishment, and the plotting of those - it will perish(10)» (Fatir);

﴿ اسْتِكْبَارًا فِي الْأَرْضِ وَمَكْرَ السَّيِّئِ وَلَا يَجِيبُ الْمَكْرَ السَّيِّئِ إِلَّا بِأَهْلِهِ فَهَلْ يَنْظُرُونَ إِلَّا سُنَّتَ الْأَوَّلِينَ فَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَبْدِيلًا وَلَنْ تَجِدَ لِسُنَّتِ اللَّهِ تَحْوِيلًا ٤٣ ﴾ (فاطر)

«[Due to] arrogance in the land and plotting of evil; but the evil plot does not encompass except its own people. Then do they await except the way of the former peoples? But you will never find in the way of Allah any change, and you will never find in the way of Allah any alteration (43)» (Fatir);

﴿ إِنَّهُمْ يَكِيدُونَ كَيْدًا ١٥ ﴾ ﴿ وَأَكِيدُ كَيْدًا ١٦ ﴾ (الطارق)

«Indeed, they are planning a plan (15) But I am planning a plan (16)» (At-Tariq);

﴿ وَالَّذِينَ كَذَّبُوا بِآيَاتِنَا سَنَسْتَدْرِجُهُمْ مِنْ حَيْثُ لَا يَعْلَمُونَ ١٨٢ ﴾ ﴿ وَأُمْلِي لَهُمْ إِنَّ كَيْدِي مَتِينٌ ١٨٣ ﴾ (الأعراف)

«But those who deny Our signs - We will progressively lead them [to destruction] from where they do not know (182) And I will give them time. Indeed, my plan is firm (183)» (Al-A'raf);

﴿ أَمْ يُرِيدُونَ كَيْدًا فَالَّذِينَ كَفَرُوا هُمُ الْمَكِيدُونَ ٤٢ ﴾ (الطور)

«Or do they intend a plan? But those who disbelieve - they are the object of a plan (42)» (At-Tur);

﴿ وَإِذَا لَفُوا الَّذِينَ آمَنُوا قَالُوا آمَنَّا وَإِذَا خَلَوْا إِلَىٰ شِيَاطِينِهِمْ قَالُوا إِنَّا مَعَكُمْ إِنَّمَا نَحْنُ مُسْتَهْزِئُونَ ١٤ ﴾ ﴿ اللَّهُ يَسْتَهْزِئُ بِهِمْ وَيَمُدَّهُمْ فِي طُغْيَانِهِمْ يَعْمَهُونَ ١٥ ﴾ (البقرة)

«And when they meet those who believe, they say, «We believe»; but when they are alone with their evil ones, they say, «Indeed, we are with you; we were only mockers.»(14) [But] Allah mocks them and prolongs them in their transgression [while] they wander blindly (15)» (Al-Baqara);

﴿ الْمُنَافِقُونَ وَالْمُنَافِقَاتُ بَعْضُهُمْ مِنْ بَعْضٍ يَأْمُرُونَ بِالْمُنْكَرِ وَيَنْهَوْنَ عَنِ الْمَعْرُوفِ وَيَقْبِضُونَ أَيْدِيَهُمْ نَسُوا اللَّهَ فَنَسِيَهُمْ إِنَّ الْمُنَافِقِينَ هُمُ الْفَاسِقُونَ ٦٧ ﴾ (التوبة)

«The hypocrite men and hypocrite women are of one another. They enjoin what is wrong and forbid what is right and close their hands. They have forgotten Allah, so He has forgotten them [accordingly]. Indeed, the hypocrites - it is they who are the defiantly disobedient (67)» (At-Tauba)

﴿وَلَا تَكُونُوا كَالَّذِينَ نَسُوا اللَّهَ فَأَنْسَاهُمْ أَنْفُسَهُمْ أُولَئِكَ هُمُ الْفَاسِقُونَ ۝ ١٩﴾ (الحشر)

«And be not like those who forgot Allah, so He made them forget themselves. Those are the defiantly disobedient (19)» (Al-Hashr).

﴿إِنَّ الَّذِينَ كَفَرُوا وَظَلَمُوا لَمْ يَكُنِ اللَّهُ لِيُغْفِرْ لَهُمْ وَلَا لِيَهْدِيَهُمْ طَرِيقًا ۝ ١٦٨﴾ ﴿إِلَّا طَرِيقَ جَهَنَّمَ خَالِدِينَ فِيهَا أَبَدًا وَكَانَ ذَلِكَ عَلَى اللَّهِ يَسِيرًا ۝ ١٦٩﴾ (النساء)

«Indeed, those who disbelieve and commit wrong [or injustice] - never will Allah forgive them, nor will He guide them to a path (168) Except the path of Hell; they will abide therein forever. And that, for Allah, is [always] easy (169)» (An-Nisaa).

Because the human agents of the secular social system have rejected the message of Allah (SWT) the above verses characterize the relationship as one of “enmity”, “plotting”, “planning”, “lure”, “mockery” and “forgetting”. Obviously, such hostile relations with almighty Allah (SWT) can only propel the evolution of the secular social system towards definite demise; towards the *Kufr* attractor and its basin.

Sine the secular social system is but the secular limit to the natural social system the only viable self-organizing social relations are those we stipulated for the latter in the subsystems of self, wealth and children, and summarized by two dictums and a deduced predilection:

1- *Live and let live.*

2- *From each according to his abilities, to each according to his needs,*

3- *Mutual consent without commitment,*

However, given the specific endo and exo social relations mentioned above the secular social system is unlikely to stabilize for long at any specific state within the *Kufr* attractor. The most likely trajectory of existence for the secular social system will be within the basin of the *Kufr* attractor where all the states are unstable.

4.4 - How Does the Secular Social System Work- its mechanisms

One of the analytical consequences of the Qur`anic worldview (QWV) is that the invisible level of reality which includes Angels, Jinn and Allah (SWT), the Creator, is an integral part of the environment of any human social system and therefore, should be considered in the analysis of any social reality. Thus, the social mechanisms of this secular social system work at four different levels (Fig 3), the first is the internal level of the macro-micro relations of the social system. The second level is that of the external environment in the visible world (earth, cosmos); the third level is that of the of the invisible level of Angels and Jinn, and the fourth level is that of Allah (SWT).

The social mechanisms that operate at the internal level of the secular social system can be categorized into four groups: *micro-micro*, *macro-micro*, *micro-macro*, *macro-macro*. The *micro-micro* social mechanisms are those that generate the individual social action; the *macro-micro* (top-down) social mechanisms are those that enable and constrain the individual and his actions morally, legally, and culturally, as well as determine the opportunities available to the particular social action in time and space. The *micro-macro* (bottom-up) social mechanisms are those that enable the individual social action to cause social change in the structure of the social system and consequently, in the social system as a whole. The mechanisms of social change could be *random* if the social system is subjected to unusual factors, e.g., *natural disasters* and *climate change*, or could be gradual and accumulated *social reform*, or, in the extreme, *social revolution*. The macro-macro social mechanisms are those that take place between the different macro aspects of the social system, e.g., between the political and the economic systems, or between the cultural and kinship systems. However, in all circumstances, the secular social system will continue to reproduce itself, though in different forms depending on time and space. This is because it is grounded on the predetermined rejection of the divine message.

The social mechanisms that operate at the internal level of the secular social system can be grouped under the umbrella of “*love for lust*” and “*love for increase*” in wealth and children, because these are the defining social objectives of the individuals who constitute the secular social system. These mechanisms pervade the social system at all its internal levels and are triggered in the first

instance by material mechanisms at the level of the human body in order to satisfy its biological nutrients as discussed in chapter 5 on the emergence of the human being. The Holy Qur`an mentions some of these mechanisms, e.g., “corruption”; “cooperation to commit aggression”; “usury”; “hoarding”; “bribery”; “cohabitation”; “prostitution”; “commitment to ancestral traditions”; “sorcery” ...etc.

The second level at which the social mechanisms operate is the external environment of the visible world consisting of earth and skies and can be grouped under the umbrella of the social mechanisms of “corruption”. This is because the secular social system is driven by the goal of maximizing worldly pleasures, primarily of wealth and children:

﴿ وَإِذَا تَوَلَّى سَعَى فِي الْأَرْضِ لِيُفْسِدَ فِيهَا وَيُهْلِكَ الْحَرْثَ وَالنَّسْلَ وَاللَّهُ لَا يُحِبُّ الْفُسَادَ ۚ ﴾ (البقرة)

«And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption (205)» Al-Baqara;

﴿ فَهَلْ عَسَيْتُمْ إِنْ تَوَلَّيْتُمْ أَنْ تُفْسِدُوا فِي الْأَرْضِ وَتَقَطُّعُوا أَرْحَامَكُمْ ۚ ﴾ (محمد)

«So would you perhaps, if you turned away, cause corruption on earth and sever your [ties of] relationship? (22)» (Muhammad);

﴿ ظَهَرَ الْفَسَادُ فِي الْبَرِّ وَالْبَحْرِ بِمَا كَسَبَتْ أَيْدِي النَّاسِ لِيُذِيقَهُمْ بَعْضَ الَّذِي عَمِلُوا لَعَلَّهُمْ يَرْجِعُونَ ۚ ﴾ (الروم)

«Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so He may let them taste part of [the consequence of] what they have done that perhaps they will return [to righteousness] (41)» (al-Rum)

﴿ وَلَوْ اتَّبَعَ الْحَقُّ أَهْوَاءَهُمْ لَفَسَدَتِ السَّمَاوَاتُ وَالْأَرْضُ وَمَنْ فِيهِنَّ بَلْ أَتَيْنَاهُمْ بِذِكْرِهِمْ فَهُمْ عَنْ ذِكْرِهِمْ مُعْرِضُونَ ۚ ﴾ (المؤمنون)

«But if the Truth had followed their inclinations, the heavens and the earth and whoever is in them would have been ruined. Rather, We have brought them their message, but they, from their message, are turning away (71)» (Al-Muminun).

The third level of mechanistic processes is that between the actors of the secular social system and the components of its environment in the invisible

world (Angels, Jinn). Angels do not have any causal powers of their own, or a degree of freedom to initiate an interaction with humans. They strictly obey orders from Allah (SWT) and do exactly what they are commanded to do. The most significant among these mechanisms are those resulting from the bonding relations between the human actors of the secular social system and Satan. They are of two types, *top-down* mechanisms conveying the influence of Satan on humans and *bottom-up* mechanisms conveying the interaction of humans with Satan. The Holy Qur`an mentions many of the potent mechanisms through which Satan overcomes humans in the secular social system thus, influencing their choices and actions in life. The satanic mechanisms mentioned in the Holy Qur`an include, among others, “direct order”; “adornment”; “incitement”; “assault”, “partnership”; “promise” as the following verses state:

﴿وَأَسْتَفْزِرُ مِنْهُم مِّنْ اسْتَطَعْتَ مِنْهُمْ بِصُوتِكَ وَأَجْلِبَ عَلَيْهِمْ بِخَيْلِكَ وَرَجِلِكَ وَشَارِكِهِمْ فِي الْأَمْوَالِ وَالْأَوْلَادِ وَعِدَّتِهِمْ وَمَا يَعِدُهُمُ الشَّيْطَانُ إِلَّا غُرُورًا ۖ﴾ (الإسراء)

«And incite [to senselessness] whoever you can among them with your voice and assault them with your horses and foot soldiers and become a partner in their wealth and their children and promise them.» But Satan does not promise them except delusion (64)» (Israel);

﴿أَلَمْ تَرَ أَنَا أَرْسَلْنَا الشَّيَاطِينَ عَلَى الْكَافِرِينَ تَؤْزُهُمْ أَزًّا ۗ﴾ (مريم)

«Do you not see that We have sent the devils upon the disbelievers, inciting them to [evil] with [constant] incitement? (83)» (Maryam).

All these potent Satanic mechanisms, which humans do not see, work to augment the social mechanisms generated internally in the secular social system with destabilizing consequences and may lead to the ultimate dismantling of the system. On the other hand, there are bottom-up social mechanism that work to cement the overcoming of Satan over humans in the secular social system, some of which have been mentioned by the Holy Qur`an, e.g., “seeking of refuge”; “worship”; “apprenticeship”:

﴿وَأَنَّهُ كَانَ رِجَالٌ مِنَ الْإِنْسِ يَعُوذُونَ بِرِجَالٍ مِنَ الْجِنِّ فَزَادُوهُمْ رَهَقًا ۗ﴾ (الجن)

«And there were men from mankind who sought refuge in men from the jinn, so they [only] increased them in burden (6)» (Al-Jinn);

﴿ قَالُوا سُبْحَانَكَ أَنْتَ وَلِيُّنَا مِنْ دُونِهِمْ بَلْ كَانُوا يَعْبُدُونَ الْجِنَّ أَكْثَرَهُمْ بِهِمْ مُؤْمِنُونَ ٤١ ﴾ (سبا)

«They will say, “Exalted are You! You, [O Allah], are our benefactor not them. Rather, they used to worship the jinn; most of them were believers in them” (41)» (Saba);

﴿ وَأَتَّبَعُوا مَا تَتْلُو الشَّيَاطِينُ عَلَىٰ مُلْكِ سُلَيْمَانَ وَمَا كَفَرَ سُلَيْمَانُ وَلَكِنَّ الشَّيَاطِينَ كَفَرُوا يُعَلِّمُونَ النَّاسَ السِّحْرَ... ١٠٢ ﴾ (البقرة)

«And they followed [instead] what the devils had recited during the reign of Solomon. It was not Solomon who disbelieved, but the devils disbelieved, teaching people magic...(102)» (Al-Baqara).

The fourth level of mechanistic processes in the secular social system is that between Allah (SWT) and the agents of the system governed by a hostile relationship due to their rejection of the divine message. These mechanisms are mainly *top-down* processes bringing down the divine decrees of Allah (SWT) on the social system and conditions it and its environment on earth. Given the Qur`anic fact that everything created by Allah (SWT) is a soldier in His army, it follows that even the very social actions and interactions of the agents become part of the mechanisms by which the divine decrees become effective, though the individuals composing the system are unaware of this fact. The following verses succinctly state the enormity of this divine omnipresence and the ensuing demise of any particular secular social system subjected to these divine mechanisms:

﴿ وَإِذْ قُلْنَا لَكَ إِنَّ رَبَّكَ أَحَاطَ بِالنَّاسِ... ٦٠ ﴾ (الإسراء)

«And [remember, O Muhammad], when We told you “Indeed, your Lord has encompassed the people”(60)» (Israel)

﴿ وَأَمَّا مَنْ يَخُلْ وَاسْتَعْتَىٰ ٨ وَكَذَّبَ بِالْحَسَنَىٰ ٩ فَسَنِيسِرُهُ لِّلْعُسْرَىٰ ١٠ ﴾ (الليل)

«But as for he who withholds and considers himself free of need (8) And denies the best [reward] (9) We will ease him toward difficulty (10)» (Al-Lail)

﴿ ثُمَّ أَنْشَأْنَا مِنْ بَعْدِهِمْ قُرُونًا آخَرِينَ ٤٢ ﴾ ﴿ مَا تَسْبِقُ مِنْ أُمَّةٍ أَجْلَهَا وَمَا يَسْتَأْخِرُونَ ٤٣ ﴾ ﴿ ثُمَّ أَرْسَلْنَا رَسُولَنَا نَتَرَىٰ كُلَّ مَا جَاءَ أُمَّةً رَسُولُهَا كَذَّبُوهُ فَاتَّبَعْنَا بَعْضَهُمْ بَعْضًا وَجَعَلْنَاهُمْ آخِادِيثَ قَبْعَدًا لِقَوْمٍ لَا يُؤْمِنُونَ ٤٤ ﴾ (المؤمنون)

«Then We produced after them other generations (42) No nation will precede its time

[of termination], nor will they remain [thereafter] (43) Then We sent Our messengers in succession. Every time there came to a nation its messenger, they denied him, so We made them follow one another [to destruction], and We made them narrations. So away with a people who do not believe (44)» (Al-Muminun);

﴿ تَاللّٰهِ لَآفَدَّا أَرْسَلْنَا إِلَىٰ أُمَمٍ مِّن قَبْلِكَ فَرَىٰ لَهُمُ الشَّيْطَانُ أَعْمَالَهُمْ فَبَوَّأَهُمْ الْيَوْمَ وَعَدَابٌ أَلِيمٌ ٦٣ ﴾ (النحل)

«By Allah, We did certainly send [messengers] to nations before you, but Satan made their deeds attractive to them. And he is the disbelievers» ally today [as well], and they will have a painful punishment (63)» (An-Nahl);

﴿ فَلَمَّا رَأَوْهُ عَارِضًا مُّسْتَقْبِلَ أَوْدِيَّتِهِمْ قَالَوا هٰذَا عَارِضٌ مُّمْطِرُنَا بَلْ هُوَ مَا اسْتَعْجَلْتُمْ بِهِ رِيحٌ فِيمَا عَدَابُ آلِيمٌ ٢٤ ﴾ ﴿ تَدْوِيرٌ كُلُّ شَيْءٍ بِأَمْرِ رَبِّهَا فَأَصْبَحُوا لَا يُرَىٰ إِلَّا مَسَاكِينُهُمْ كَذٰلِكَ نَجْزِي الْقَوْمَ الْمُجْرِمِينَ ٢٥ ﴾ (الأحقاف)

«And when they saw it as a cloud approaching their valleys, they said, «This is a cloud bringing us rain!» Rather, it is that for which you were impatient: a wind, within it a painful punishment (24) Destroying everything by command of its Lord. And they became so that nothing was seen [of them] except their dwellings. Thus do We recompense the criminal people (25)» (Al-Ahqaf);

﴿ وَاتْلُ عَلَيْنَا نَبَأَ الَّذِي آتَيْنَاهُ آيَاتِنَا فَانْسَلَخَ مِنْهَا فَاتَّبَعَهُ الشَّيْطَانُ فَكَانَ مِنَ الْعَاوِينَ ١٧٥ ﴾ ﴿ وَلَوْ شِئْنَا لَرَفَعْنَاهُ بِهَا وَلٰكِنَّهُ أَخْلَدَ إِلَى الْاَرْضِ وَاتَّبَعَ هَوَاهُ فَمَثَلُهُ كَمَثَلِ الْكَلْبِ إِنْ تَحْمِلْ عَلَيْهِ يَلْهَثْ أَوْ تَتْرِكْهُ يَلْهَثْ ذٰلِكَ مَثَلُ الْقَوْمِ الَّذِيْنَ كَذَّبُوا بِآيَاتِنَا فَاقْصُصِ الْقَصَصَ لَعَلَّهُمْ يَتَفَكَّرُونَ ١٧٦ ﴾ (الأعراف)

«And recite to them, [O Muhammad], the news of him to whom we gave [knowledge of] Our signs, but he detached himself from them; so, Satan pursued him, and he became of the deviators (175) And if We had willed, we could have elevated him thereby, but he adhered [instead] to the earth and followed his own desire. So, his example is like that of the dog: if you chase him, he pants, or if you leave him, he [still] pants. That is the example of the people who denied Our signs. So relate the stories that perhaps they will give thought (176)» (Al-A'raf);

﴿ أَمْ أُنزِلُوا أَمْرًا فَإِنَّا مُرْسِلُونَ ٧٩ ﴾ ﴿ أَمْ يَحْسَبُونَ أَنَّا لَا نَسْمَعُ سِرَّهُمْ وَنَجْوَاهُمْ بَلَىٰ وَرُسُلُنَا لَدَيْهِمْ يَكْتُبُونَ ٨٠ ﴾ (الزخرف)

« Or have they devised [some] affair? But indeed, We are devising [a plan] (79) » «Or do they think that We hear not their secrets and their private conversations? Yes, [We do], and Our messengers are with them recording (80)» (Az-Zukhruf);

﴿ طسم ١ تِلْكَ آيَاتُ الْكِتَابِ الْمُبِينِ ٢ ﴾ ﴿ نَتْلُو عَلَيْكَ مِنْ نَبَأِ مُوسَى وَفِرْعَوْنَ بِالْحَقِّ لِقَوْمٍ يُؤْمِنُونَ ٣ ﴾ ﴿ إِنَّ فِرْعَوْنَ عَلَا فِي الْأَرْضِ وَجَعَلَ أَهْلَهَا شِيَعًا يَسْتَضِعُّفُ طَائِفَةً مِنْهُمْ يَتَّبِعُ أَبْنَاءَهُمْ وَيَسْتَحْيِي نِسَاءَهُمْ إِنَّهُ كَانَ مِنَ الْمُفْسِدِينَ ٤ ﴾ ﴿ وَنُرِيدُ أَنْ نَمُنَّ عَلَى الَّذِينَ اسْتَضَعُّوا فِي الْأَرْضِ وَنَجْعَلَهُمْ أَيْمَةً وَنَجْعَلِ لِهِمُ الْوَارِثِينَ ٥ ﴾ ﴿ وَنُمَكِّنَ لَهُمْ فِي الْأَرْضِ وَنُرِي فِرْعَوْنَ وَهَامَانَ وَجُنُودَهُمَا مِنْهُمْ مَا كَانُوا يَحْذَرُونَ ٦ ﴾ ﴿ وَأَوْحَيْنَا إِلَىٰ أُمِّ مُوسَىٰ أَنْ أَرْضِعِيهِ فَإِذَا خَفْتِ عَلَيْهِ فَلِجْجِهِ فِي الْأَيْمِ وَلَا تخَافِي وَلَا تَحْزَنِي إِنَّا رَادُّوهُ إِلَىٰ بَيْتِكَ وَجَاعِلُوهُ مِنَ الْمُرْسَلِينَ ٧ ﴾ ﴿ فَالْتَقَطَهُ آلُ فِرْعَوْنَ لِيَكُونَ لَهُمْ عَدُوًّا وَحَزَنًا إِنَّ فِرْعَوْنَ وَهَامَانَ وَجُنُودَهُمَا كَانُوا خَاطِبِينَ ٨ ﴾ ﴿ وَقَالَتِ امْرَأَتُ فِرْعَوْنَ قُرَّتْ عَيْنِي لِی وَلَئِكَ لَا تَقْتُلُوهُ عَسَىٰ أَنْ يَنْفَعَنَا أَوْ نَتَّخِذَهُ وَلَدًا وَهُمْ لَا يَشْعُرُونَ ٩ ﴾ ﴿ وَأَصْبَحَ فُؤَادُ أُمِّ مُوسَىٰ فَارِعًا إِنْ كَادَتْ لِتُتْبِدِي بِهِ لَوْلَا أَنْ رَبَطْنَا عَلَىٰ قَلْبِهَا لِتَكُونَ مِنَ الْمُؤْمِنِينَ ١٠ ﴾ ﴿ وَقَالَتْ لِأُخْتِهِ قُصِّيهِ فَبَصُرَتْ بِهِ عَنْ جُنُبٍ وَهُمْ لَا يَشْعُرُونَ ١١ ﴾ ﴿ وَحَرَمْنَا عَلَيْهِ الْمَرَاضِعَ مِنْ قَبْلِ فَقَالَتْ هَلْ أَدُلُّكُمْ عَلَىٰ أَهْلِ بَيْتٍ يَكْفُلُونَهُ لَكُمْ وَهُمْ لَهُ نَاصِحُونَ ١٢ ﴾ ﴿ فَرَدَدْنَاهُ إِلَىٰ أُمِّهِ كَيْ تَقَرَّ عَيْنُهَا وَلَا تَحْزَنَ وَلِتَعْلَمَ أَنَّ وَعْدَ اللَّهِ حَقٌّ وَلَكِنَّ أَكْثَرَهُمْ لَا يَعْلَمُونَ ١٣ ﴾ (القصاص)

«Ta, Seen, Meem (1) These are the verses of the clear Book (2) We recite to you from the news of Moses and Pharaoh in truth for a people who believe (3) Indeed, Pharaoh exalted himself in the land and made its people into factions, oppressing a sector among them, slaughtering their [newborn] sons and keeping their females alive. Indeed, he was of the corrupters (4) And We wanted to confer favor upon those who were oppressed in the land and make them leaders and make them inheritors (5) And establish them in the land and show Pharaoh and [his minister] Haman and their soldiers through them that which they had feared(6) And We inspired to the mother of Moses, “Suckle him; but when you fear for him, cast him into the river and do not fear and do not grieve. Indeed, We will return him to you and will make him [one] of the messengers.” (7) And the family of Pharaoh picked him up [out of the river] so that he would become to them an enemy and a [cause of] grief. Indeed, Pharaoh and Haman and their soldiers were deliberate sinners (8) And the wife of Pharaoh said, “[He will be] a comfort of the eye for me and for you. Do not kill him; perhaps he may benefit us, or we may adopt him as a son.” And they perceived not (9) And the heart of Moses’ mother became empty [of all else]. She was about to disclose [the matter concerning] him had We not bound fast her heart that she would be of the believers (10) And she said to his sister, “Follow him”; so she watched him from a distance while they perceived not (11) And We had prevented from him [all] wet nurses before, so she said, “Shall I direct you to a household that will be responsible for him for you while they are to him [for his upbringing] sincere?” (12) So We restored him to his mother that she might be content and not grieve and that she would know that the promise of Allah is true. But most of the people do not know (13)» (Al-Qasas).

There are some social mechanisms when activated by the agents of the social system Allah SWT uses similar mechanisms to counter act the intended effects

by the agents, e.g., “plotting”; “planning”; “lure”; ‘mockery”. However, though as social mechanisms within the secular social system they are intended to cause harm Allah SWT uses similar mechanisms to thwart these intended harmful effects and may even generate unintended extra positive effects:

﴿وَأَذِّبْكُمْ بِكِ الَّذِينَ يُكْفُرُوا لِئِثْبُوتِكُمْ أَوْ يَكْفُرُوكَ وَإِخْرَاجُكُمْ وَيَمْكُرُونَ وَيَمْكُرُ اللَّهُ وَاللَّهُ خَبِيرُ الْمَاكِرِينَ ۝٣٠﴾ (الأنفال)

«And [remember, O Muhammad], when those who disbelieved plotted against you to restrain you or kill you or evict you [from Makkah]. But they plan, and Allah plans. And Allah is the best of planners (30)» (Al-Anfal).

An IIOK Exercise

▪ **The systemic mechanismic explanation: an example from the holy Qur`an:**

﴿لَقَدْ كَانَ لِسَبَإٍ فِي مَسْكَنِهِمْ آيَةٌ جَنَّتَانِ عَنْ يَمِينٍ وَشِمَالٍ كُلُوا مِنْ رِزْقِ رَبِّكُمْ وَاشْكُرُوا لَهُ بَلْدَةٌ طَيِّبَةٌ وَرَبٌّ غَفُورٌ ۝١٥﴾
 ﴿فَأَعْرَضُوا فَأَرْسَلْنَا عَلَيْهِمْ سَيْلَ الْعَرِمِ وَبَدَّلْنَاهُمْ بِجَنَّتَيْهِمْ جَنَّتَيْنِ ذَوَاتِیْ أَكْلِ حَمِطٍ وَأَثَلٍ وَشَجَرٍ مِنْ سِدْرٍ قَلِيلٍ ۝١٦﴾ ذَلِكْ
 جَزَيْنَاهُمْ بِمَا كَفَرُوا وَهَلْ نُجَازِي إِلَّا الْكَفُورَ ۝١٧﴾ وَجَعَلْنَا بَيْنَهُمْ وَبَيْنَ الْقُرَى الَّتِي بَارَكْنَا فِيهَا قُرَى ظَاهِرَةً وَقَدَرْنَا فِيهَا السَّبْزَ
 سَبْرًا فِيهَا لِيَالِي وَأَيَّامًا أَمِينٌ ۝١٨﴾ ﴿فَقَالُوا رَبَّنَا بَاعِدْ بَيْنَ أَسْفَارِنَا وَظَلَمُوا أَنْفُسَهُمْ فَجَعَلْنَاهُمْ أَحَادِيثَ وَمَرَقْنَاَهُمْ كُلَّ مَرَقٍ
 إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّكُلِّ صَبَّارٍ شَكُورٍ ۝١٩﴾ ﴿وَلَقَدْ صَدَّقَ عَلَيْهِمْ إِبْلِيسُ ظَنَّهُ فَاتَّبَعُوهُ إِلَّا قَرِيقًا مِنَ الْمُؤْمِنِينَ ۝٢٠﴾ ﴿وَمَا كَانَ لَهُ
 عَلَيْهِمْ مِنْ سُلْطَانٍ إِلَّا لِنَعْلَمَ مَنْ يُؤْمِنُ بِالْآخِرَةِ مِمَّنْ هُوَ مِنْهَا فِي شَكٍّ وَرَبُّكَ عَلَىٰ كُلِّ شَيْءٍ حَفِيظٌ ۝٢١﴾ (سبا)

«There was for [the tribe of] Saba' in their dwelling place a sign: two [fields of] gardens on the right and on the left. [They were told], “Eat from the provisions of your Lord and be grateful to Him. A good land [have you], and a forgiving Lord.” (15) But they turned away [refusing], so We sent upon them the flood of the dam, and We replaced their two [fields of] gardens with gardens of bitter fruit, tamarisks and something of sparse lote trees (16) [By] that We repaid them because they disbelieved. And do We [thus] repay except the ungrateful? (17) And We placed between them and the cities which We had blessed [many] visible cities. And We determined between them the [distances of] journey, [saying], “Travel between them by night or day in safety.” (18) But [insolently] they said, “Our Lord, lengthen the distance between our journeys,” and wronged themselves, so We made them narrations and dispersed them in total dispersion. Indeed, in that are signs for everyone patient and grateful (19) And Iblees had already confirmed through them his assumption, so they followed him, except for a party of believers (20) And he had over them no authority except [it was decreed] that We might make evident who believes in the Hereafter from who is thereof in doubt. And your Lord, over all things, is Guardian (21)» (Saba).

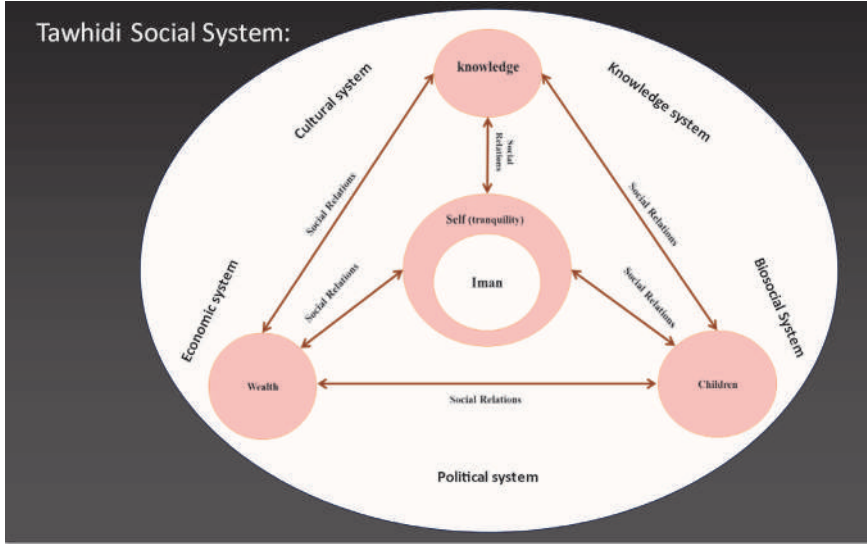
* The phenomenon of Saba` is a classic Qur`anic example of the systemic approach to explanation which spans many vertical and horizontal levels of reality, including the observable and unobservable worlds. The above verses describe a series of historical entangled social, natural and demographic events as if taking a flashforward snapshot from our current world. The ontological, epistemological and methodological issues raised by this phenomenon fit smoothly in the systemic framework of analysis for the secular social system which we presented in the last few pages. The exercise is the following:

Use the systemic approach to explanation, the QWV as a guiding philosophical framework, situate the Saba` phenomenon within the secular social system framework and give a scientific mechanistic explanation of the events that took place as narrated by the above verses.

5 - The Tawhidi Social System

The Tawhidi social system is depicted by Fig. 5 below. It is the other limit of the general natural social system and, in contradistinction to the secular social system, it is grounded on the assumption that Allah (SWT) has brought down His revelation to the people of the natural society, who accepted the message and every individual in the system became a believer (*Mu`min*) in Allah (SWT) and His messengers. It is also a designed social system, but the main frame is not designed by the agents of the system as in the secular social system but by Allah (SWT) via detailed injunctions and moral prescriptions contained in revelation (Qur`an, Sunnah) and span the micro and macro levels of the Tawhidi social system (self, wealth, children, knowledge)- Fig. 5. This edifice of revealed knowledge, the inscription of its guidance in the hearts of believers (*Mu`minin*) and the strict adherence by them to this guidance in their actions and interactions, generate a unique configuration of bonding social relations which become manifest in the ability of the system to self-organize all along its path of evolution in the attractor Iman.

Fig. 5: Tawhidi Social System



5.1 - Composition of the System

The following verses describe the characteristics of the agents of the Tawhidi social system:

﴿قَدْ أَفْلَحَ الْمُؤْمِنُونَ ۝١﴾ ﴿الَّذِينَ هُمْ فِي صَلَاتِهِمْ خَاشِعُونَ ۝٢﴾ ﴿وَالَّذِينَ هُمْ عَنِ اللَّغْوِ مُعْرِضُونَ ۝٣﴾ ﴿وَالَّذِينَ هُمْ لِلزَّكَاةِ فَاعِلُونَ ۝٤﴾ ﴿وَالَّذِينَ هُمْ لِفُرُوجِهِمْ حَافِظُونَ ۝٥﴾ ﴿إِلَّا عَلَىٰ أَزْوَاجِهِمْ أَوْ مَا مَلَكَتْ أَيْمَانُهُمْ فَإِنَّهُمْ غَيْرُ مَلُومِينَ ۝٦﴾ ﴿فَمَن ابْتَغَىٰ زَوَاءَ ذَلِكَ فَوُثِّقَ لَهُمُ الْعَادُونَ ۝٧﴾ ﴿وَالَّذِينَ هُمْ لِأَمَانَاتِهِمْ وَعَهْدِهِمْ رَاعُونَ ۝٨﴾ ﴿وَالَّذِينَ هُمْ عَلَىٰ صَلَوَاتِهِمْ يُحَافِظُونَ ۝٩﴾ (المؤمنون)

«Certainly will the believers have succeeded:(1) They who are during their prayer humbly submissive (2) And they who turn away from ill speech (3) And they who are observant of zakah (4) And they who guard their private parts (5) Except from their wives or those their right hands possess, for indeed, they will not be blamed (6) But whoever seeks beyond that, then those are the transgressors (7) And they who are to their trusts and their promises attentive(8) And they who carefully maintain their prayers(9)» (Al-Mu'minun);

﴿التَّائِبُونَ الْعَابِدُونَ الْحَامِدُونَ السَّائِحُونَ الرَّاكِعُونَ السَّاجِدُونَ الْأَمْرُونَ بِالْمَعْرُوفِ وَالنَّاهُونَ عَنِ الْمُنْكَرِ وَالْحَافِظُونَ لِحُدُودِ اللَّهِ وَبَشِّرِ الْمُؤْمِنِينَ ۝١١٢﴾ (التوبة)

«[Such believers are] the repentant, the worshippers, the praisers [of Allah], the travelers [for His cause], those who bow and prostrate [in prayer], those who enjoin what is right and forbid what is wrong, and those who observe the limits [set by] Allah. And give good tidings to the believers (112)» (At-Tauba);

﴿إِنَّ الْمُسْلِمِينَ وَالْمُسْلِمَاتِ وَالْمُؤْمِنِينَ وَالْمُؤْمِنَاتِ وَالْقَانِتِينَ وَالْقَانِتَاتِ وَالصَّادِقِينَ وَالصَّادِقَاتِ وَالصَّابِرِينَ وَالصَّابِرَاتِ وَالْخَاشِعِينَ وَالْخَاشِعَاتِ وَالْمُتَصَدِّقِينَ وَالْمُتَصَدِّقَاتِ وَالصَّائِمِينَ وَالصَّائِمَاتِ وَالْحَافِظِينَ فُرُوجَهُمْ وَالْحَافِظَاتِ وَالذَّاكِرِينَ اللَّهَ كَثِيرًا وَالذَّاكِرَاتِ أَعَدَّ اللَّهُ لَهُمْ مَغْفِرَةً وَأَجْرًا عَظِيمًا ٣٥﴾ (الأحزاب)

«Indeed, the Muslim men and Muslim women, the believing men and believing women, the obedient men and obedient women, the truthful men and truthful women, the patient men and patient women, the humble men and humble women, the charitable men and charitable women, the fasting men and fasting women, the men who guard their private parts and the women who do so, and the men who remember Allah often and the women who do so - for them Allah has prepared forgiveness and a great reward (35)» (Al-Ahzab);

﴿إِنَّ الَّذِينَ هُمْ مِنْ خَشْيَةِ رَبِّهِمْ مُشْفِقُونَ ٥٧﴾ ﴿وَالَّذِينَ هُمْ بِآيَاتِ رَبِّهِمْ يُؤْمِنُونَ ٥٨﴾ ﴿وَالَّذِينَ هُمْ بِرَبِّهِمْ لَا يُشْرِكُونَ ٥٩﴾ ﴿وَالَّذِينَ يُؤْتُونَ مَا آتَوْا وَقُلُوبُهُمْ وَجَلَةٌ أَنَّهُمْ إِلَىٰ رَبِّهِمْ رَاجِعُونَ ٦٠﴾ ﴿أُولَٰئِكَ يُسَارِعُونَ فِي الْخَيْرَاتِ وَهُمْ لَهَا سَابِقُونَ ٦١﴾ (المؤمنون)

«Indeed, they who are apprehensive from fear of their Lord (57) And they who believe in the signs of their Lord (58) And they who do not associate anything with their Lord (59) And they who give what they give while their hearts are fearful because they will be returning to their Lord (60) It is those who hasten to good deeds, and they outstrip [others] therein (61)» (Al-Muminun);

﴿الصَّابِرِينَ وَالصَّادِقِينَ وَالْقَانِتِينَ وَالْمُنْفِقِينَ وَالْمُسْتَغْفِرِينَ بِالْأَسْحَارِ ١٧﴾ (آل عمران)

«The patient, the true, the obedient, those who spend [in the way of Allah], and those who seek forgiveness before dawn (17)» (Ali Imran);

﴿وَاعْلَمُوا أَنَّ فِيكُمْ رَسُولَ اللَّهِ لَوْ يُطِيعُكُمْ فِي كَثِيرٍ مِنَ الْأَمْرِ لَعَنِتُّمْ وَلَكِنَّ اللَّهَ حَبَّبَ إِلَيْكُمُ الْإِيمَانَ وَزَيَّنَهُ فِي قُلُوبِكُمْ وَكَرَّهَ إِلَيْكُمُ الْكُفْرَ وَالْفُسُوقَ وَالْعِصْيَانَ أُولَٰئِكَ هُمُ الرَّاشِدُونَ ٧﴾ (الحجرات)

«And know that among you is the Messenger of Allah. If he were to obey you in much of the matter, you would be in difficulty, but Allah has endeared to you the faith and has made it pleasing in your hearts and has made hateful to you disbelief, defiance and

disobedience. Those are the [rightly] guided (7)» (Al-Hujurat);

﴿أَمَّنَ الرَّسُولُ بِمَا أُنزِلَ إِلَيْهِ مِنْ رَبِّهِ وَالْمُؤْمِنُونَ كُلٌّ آمَنَ بِاللَّهِ وَمَلَائِكَتِهِ وَكُتُبِهِ وَرُسُلِهِ لَا نُفَرِّقُ بَيْنَ أَحَدٍ مِنْ رُسُلِهِ وَقَالُوا سَمِعْنَا وَأَطَعْنَا غُفْرَانَكَ رَبَّنَا وَإِلَيْكَ الْمَصِيرُ ٢٨٥﴾ (البقرة)

«The Messenger has believed in what was revealed to him from his Lord, and [so have] the believers. All of them have believed in Allah and His angels and His books and His messengers, [saying], «We make no distinction between any of His messengers.» And they say, «We hear and we obey. [We seek] Your forgiveness, our Lord, and to You is the [final] destination.»(285)» (Al-Baqara);

﴿إِنَّمَا الْمُؤْمِنُونَ الَّذِينَ إِذَا ذُكِرَ اللَّهُ وَجِلَّتْ قُلُوبُهُمْ وَإِذَا تُلِيَتْ عَلَيْهِمْ آيَاتُهُ زَادَتْهُمْ إِيمَانًا وَعَلَىٰ رَبِّهِمْ يَتَوَكَّلُونَ ٢﴾ ﴿الَّذِينَ يُقِيمُونَ الصَّلَاةَ وَمِمَّا رَزَقْنَاهُمْ يُنْفِقُونَ ٣﴾ ﴿أُولَٰئِكَ هُمُ الْمُؤْمِنُونَ حَقًّا لَهُمْ دَرَجَاتٌ عِنْدَ رَبِّهِمْ وَمَغْفِرَةٌ وَرِزْقٌ كَرِيمٌ ٤﴾ (الأنفال)

«The believers are only those who, when Allah is mentioned, their hearts become fearful, and when His verses are recited to them, it increases them in faith; and upon their Lord they rely (2) The ones who establish prayer, and from what We have provided them, they spend (3) Those are the believers, truly. For them are degrees [of high position] with their Lord and forgiveness and noble provision (4)» (Al-Anfal);

﴿إِنَّمَا الْمُؤْمِنُونَ إِخْوَةٌ فَأَصْلِحُوا بَيْنَ أَخَوَيْكُمْ وَاتَّقُوا اللَّهَ لَعَلَّكُمْ تُرْحَمُونَ ١٠﴾ (الحجرات)

«The believers are but brothers, so make settlement between your brothers. And fear Allah that you may receive mercy (10)» (Al-Hujurat);

﴿إِنَّمَا كَانَ قَوْلَ الْمُؤْمِنِينَ إِذَا دُعُوا إِلَى اللَّهِ وَرَسُولِهِ لِيَحْكُمَ بَيْنَهُمْ أَنْ يَقُولُوا سَمِعْنَا وَأَطَعْنَا وَأُولَٰئِكَ هُمُ الْمُفْلِحُونَ ٥١﴾ (النور)

«The only statement of the [true] believers when they are called to Allah and His Messenger to judge between them is that they say, «We hear and we obey.» And those are the successful (51)» (An-Nur);

﴿وَالْمُؤْمِنُونَ وَالْمُؤْمِنَاتُ بَعْضُهُمْ أَوْلِيَاءُ بَعْضٍ يَأْمُرُونَ بِالْمَعْرُوفِ وَيَنْهَوْنَ عَنِ الْمُنْكَرِ وَيُقِيمُونَ الصَّلَاةَ وَيُؤْتُونَ الزَّكَاةَ وَيُطِيعُونَ اللَّهَ وَرَسُولَهُ أُولَٰئِكَ سَيَرْحَمُهُمُ اللَّهُ إِنَّ اللَّهَ عَزِيزٌ حَكِيمٌ ٧١﴾ (التوبة)

«The believing men and believing women are allies of one another. They enjoin what is right and forbid what is wrong and establish prayer and give zakah and obey Allah and His Messenger. Those - Allah will have mercy upon them. Indeed, Allah is

Exalted in Might and Wise (71)» (At-Tauba);

﴿مُحَمَّدٌ رَسُولُ اللَّهِ وَالَّذِينَ مَعَهُ أَشِدَّاءُ عَلَى الْكُفَّارِ رُحَمَاءُ بَيْنَهُمْ تَرَاهُمْ رُكَّعًا سُجَّدًا يَبْتَغُونَ فَضْلًا مِنَ اللَّهِ وَرِضْوَانًا سِيمَاهُمْ فِي وُجُوهِهِمْ مِنْ أَثَرِ السُّجُودِ ذَلِكَ مَثَلُهُمْ فِي التَّوْرَةِ وَمَثَلُهُمْ فِي الْإِنْجِيلِ كَرَزَعٍ أُخْرِجَ شَطَأُهَا فَاذْرَاهَا فَاسْتَوَتْ فَأَسْتَوتَى عَلَى سَوْقِهِ يُعْجِبُ الرُّعَاةَ لِغَيْظِ بِهِمُ الْكُفَّارِ وَعَدَّ اللَّهُ الَّذِينَ آمَنُوا وَعَمِلُوا الصَّالِحَاتِ مِنْهُمْ مَغْفِرَةً وَأَجْرًا عَظِيمًا ﴿٢٩﴾ (الفتح)

«Muhammad is the Messenger of Allah; and those with him are forceful against the disbelievers, merciful among themselves. You see them bowing and prostrating [in prayer], seeking bounty from Allah and [His] pleasure. Their mark is on their faces from the trace of prostration. That is their description in the Torah. And their description in the Gospel is as a plant which produces its offshoots and strengthens them so they grow firm and stand upon their stalks, delighting the sowers - so that Allah may enrage by them the disbelievers. Allah has promised those who believe and do righteous deeds among them forgiveness and a great reward (29)» (Al-Fat-h);

﴿يَعْمَلُونَ لَهُ مَا يَشَاءُ مِنْ مَحَارِبٍ وَتَمَائِيلٍ وَجَفَانٍ كَالْجَوَابِ وَقُدُورٍ رَاسِيَاتٍ اعْمَلُوا آلَ دَاوُدَ شُكْرًا وَقَلِيلٍ مِنْ عِبَادِيَ الشَّاكِرِينَ ﴿١٣﴾﴾ (سبا)

«They made for him what he willed of elevated chambers, statues, bowls like reservoirs, and stationary kettles. [We said], «Work, O family of David, in gratitude.» And few of My servants are grateful (13)» (Saba);

﴿إِنَّ الَّذِينَ يُغْضُونَ صُؤُوتَهُمْ عِنْدَ رَسُولِ اللَّهِ أُولَئِكَ الَّذِينَ امْتَحَنَ اللَّهُ قُلُوبَهُمْ لِلتَّقْوَى لَهُمْ مَغْفِرَةٌ وَأَجْرٌ عَظِيمٌ ﴿٣﴾﴾ (الحجرات)

«Indeed, those who lower their voices before the Messenger of Allah - they are the ones whose hearts Allah has tested for righteousness. For them is forgiveness and great reward (3)» (Al-Hujurat).

The above verses describe the properties, states and types of action and interaction of the *Mu'minin*, the righteous actors who constitute the Tawhidi social system where, in contradistinction to the secular social system, the self is dominated by the acquired properties of piety from the soul system in addition to emergent properties conducive to them, and tempering them to the service of Allah (SWT). This dominance of acquired and emergent piety properties in the self system is a direct result of believing by the agents of the Tawhidi social system in Allah (SWT) and founding their actions and

interactions and the ensuing bonding social relations on the injunctions of the divine message. All the actions of the actors who constitute the system are righteous, and all their states of development are those of being steadfast along the straight path.

The overall objective of the Tawhidi social system is to enable its human agents to concretize the meaning of worshipping Allah (SWT) in the form of good work on earth, thus enabling the Tawhidi social system to generate the commons via the synergistic actions of its agents, particularly in the domain of wealth and children. The singular common good that must be provided by the Tawhidi social system as output is that of *Iman* which requires, for its generation and preservation, processes of productive work, private and public, as input in the main subsystems of *knowledge; self; wealth; children* and *politics*. Preservation of a certain necessary level of *knowledge; self; wealth* and *children* at the micro level by every individual agent of the Tawhidi social system is a must in order to preserve his *Iman*. The preservation of the macro social system that enables all its agents to procure these commons is a must and the responsibility of the political system. Thus, we have the five universals which must be preserved at the micro level by each Mu'min (*Iman; knowledge; self; wealth, children*) and a six universal at the macro level, namely the Tawhidi social system, which must be preserved by political authority.

We claim that the Tawhidi society is the empirical manifestation of the conceptual model of the Tawhidi social system as it unfolds below. On the other hand, the latter is an ideal type model of the religion of Islam as it exists as a conceptual system in revelation (Qur'an, Sunnah) and ordained by Allah (SWT) to be established on earth by Muslims:

﴿شَرَعَ لَكُمْ مِنَ الدِّينِ مَا وَصَّىٰ بِهِ نُوحًا وَالَّذِي أَوْحَيْنَا إِلَيْكَ وَمَا وَصَّيْنَا بِهِ إِبْرَاهِيمَ وَمُوسَىٰ وَعِيسَىٰ أَنْ أَقِيمُوا الدِّينَ وَلَا تَتَفَرَّقُوا فِيهِ كَبُرَ عَلَى الْمُشْرِكِينَ مَا تَدْعُوهُمْ إِلَيْهِ اللَّهُ يَجْتَبِي إِلَيْهِ مَنْ يَشَاءُ وَمَهْدِي إِلَيْهِ مَنْ يُنِيبُ ۝۱۳﴾ (الشورى)

«He has ordained for you of religion what He enjoined upon Noah and that which We have revealed to you, [O Muhammad], and what We enjoined upon Abraham and Moses and Jesus - to establish the religion and not be divided therein. Difficult for those who associate others with Allah is that to which you invite them. Allah chooses for Himself whom He wills and guides to Himself whoever turns back [to Him] (13)» (Ash-Shura)

The subsystems of the Tawhidi social system are stratified vertically and horizontally by unique configurations of social relations and as such define the Tawhidi social system. The fundamental processes of righteous productive labour in these subsystems also define the Qur`anic concepts of *progress* and *regress* at the micro individual level and the concept of *social evolution* at the macro societal level. This reminds us of what Mario Bunge said about the study of social systems, namely that, unlike natural physical and biological systems, the former are man-made, therefore, it is not sufficient to analyze them in terms of their CESM but also in terms of their essential social subsystems. For the Tawhidi social system these subsystems are the biosocial; economic; political, knowledge and cultural systems.

If the secular social system is driven by maximizing worldly pleasure and guided by actors` whims, then the Tawhidi social system is driven by maximizing Iman and guided by knowledge (علم) acquired by actors from revelation and the world. The role of knowledge in the secular social system is instrumental while it is substantial in the Tawhidi social system. Knowledge has a unique role in the Tawhidi social system in that it alone defines every other aspect of the system, so much so that the human agents are strictly ordered not to follow anything without requisite knowledge for it. It is people with such knowledge who are the true believers in Allah (SWT) and who should be the reference to others on any contentious issue which may arise in the system. The following verses corroborate these claims:

﴿وَلَا تَقْفُ مَا لَيْسَ لَكَ بِهِ عِلْمٌ إِنَّ السَّمْعَ وَالْبَصَرَ وَالْفُؤَادَ كُلُّ أُولَئِكَ كَانَ عَنْهُ مَسْئُولًا﴾ (الإسراء) ٣٦

«And do not pursue that of which you have no knowledge. Indeed, the hearing, the sight and the heart - about all those [one] will be questioned (36)» (Isra);

﴿وَإِذَا جَاءَهُمْ أَمْرٌ مِنَ الْأَمْنِ أَوْ الْخَوْفِ أَذَاعُوا بِهِ وَلَوْ رَدُّوهُ إِلَى الرَّسُولِ وَإِلَى أُولِي الْأَمْرِ مِنْهُمْ لَعَلِمَهُ الَّذِينَ يَسْتَنْبِطُونَهُ مِنْهُمْ وَلَوْ لَا فَضْلُ اللَّهِ عَلَيْكُمْ وَرَحْمَتُهُ لَاتَّبَعْتُمُ الشَّيْطَانَ إِلَّا قَلِيلًا﴾ (النساء) ٨٣

«And when there comes to them information about [public] security or fear, they spread it around. But if they had referred it back to the Messenger or to those of authority among them, then the ones who [can] draw correct conclusions from it would have known about it. And if not for the favor of Allah upon you and His mercy, you would have followed Satan, except for a few (83)» (An-Nisaa);

﴿وَمِنَ النَّاسِ وَالْدَّوَابِّ وَالْأَنْعَامِ مُخْتَلِفٌ أَلْوَانُهُ كَذَلِكَ إِنَّمَا يَخْشَى اللَّهَ مِنْ عِبَادِهِ الْعُلَمَاءُ إِنَّ اللَّهَ عَزِيزٌ غَفُورٌ ۨ﴾ (فاطر)

«And among people and moving creatures and grazing livestock are various colors similarly. Only those fear Allah, from among His servants, who have knowledge. Indeed, Allah is Exalted in Might and Forgiving (28)» (Fatir).

Wealth and children are considered by actors in the Tawhidi social system (Mu'minun), not only as allurements, but also bounties that require thankfulness to their provider. This activates and enables the manifestation of the property of 'thankfulness' to be ubiquitous and pervasive in social actions and relations in the Tawhidi social system in response to the bounties of wealth and children.

5.2 - Environment of the Tawhidi Social System

The external environment of the Tawhidi social system is the same as that of the secular social system, with earth, cosmos and Revelation constituting the observable world and Angels and Jinn constituting the invisible world. Beyond these two worlds there is Allah (SWT), the Creator and Sustainer of both worlds. While Revelation has negligible presence in the environment of the secular social system it has a ubiquitous and pervasive presence in the Tawhidi social system because the whole system is grounded on its tenets. Revelation may take the form of a sacred revealed book preserved by Allah (SWT) from any changes- only the Holy Qur'an satisfies this condition- or, in the form of prophetic teachings learned by rote by their companions and expounded by scholars, generation after generation.

5.3 - Structure of the Tawhidi Social System

The Tawhidi social system has endostructure relating the components of the social system and exostructure relating these components to the environment in the observable and the unobservable world. Grounding the social system on Revelation by assumption means that every aspect of it reflects divine injunctions and the actions and interactions of the agents of the system satisfy the following description:

﴿إِنَّمَا كَانَ قَوْلَ الْمُؤْمِنِينَ إِذَا دُعُوا إِلَى اللَّهِ وَرَسُولِهِ لِيَحْكُمَ بَيْنَهُمْ أَنْ يَقُولُوا سَمِعْنَا وَأَطَعْنَا وَأُولَئِكَ هُمُ الْمُفْلِحُونَ ۨ﴾ (النور)

«The only statement of the [true] believers when they are called to Allah and His Messenger to judge between them is that they say, «We hear and we obey.» And those are the successful (51)» (An-Nur).

Thus, all human agents in the Tawhidi social system are righteous and their actions satisfy the conditions of righteousness. There are structural social bonds of a general nature that characterize the relations between the righteous believers stressed by the verses mentioned at the beginning of our discussion of this system. Some of these general social bonds are: “alliance”; “brotherhood”; “being merciful”; “enjoining what is right”; “forbidding what is wrong”; “consultation”; “justice”; “benevolence”; “mending relations”. Additional general bonds mentioned by the prophetic sunnah: “love”; “cordiality”; “advice”; “support” etc.

Some of these general bonds are domain specific, like the economic domain: “giving to relatives”; “maintaining the balance”; “charity” ...etc. In the biosocial domain there are bonds that govern men and women who are foreigners to each other, e.g., “lowering eyesight”; «enjoining good”; “forbidding immoral acts”; “avoiding private meetings”; “guarding private parts”; “women not exposing adornments” ...etc. The kinship relations are based on “mercy”; “cordiality”; “love”; “respect”; “advice”; «entitlement”; “support” ...etc. In the political domain we find bonds like “shura”; “justice”; “advice”; “enjoining good”; “standing by” ...etc.

All these internal bonding social relations, their role in enabling and constraining actors, and the actions and interactions which generate them in the Tawhidi social system are anchored in the divine properties of piety of the soul system which act like a scaffolding for righteous social actions and relations.

The external relations between the human agents of the Tawhidi social system and its environment span three levels, that of the observable world consisting of earth, cosmos and Revelation, that of the invisible world consisting of Angels and Jinn, then the relations with Allah (SWT). Within the visible world, the bonding relations between the righteous agents of the system and Revelation are those of “warning”; “glad tidings”; “guidance”; “healing”; “tranquility”; “learning”; “reflection”; “purification” ...etc. The overarching bonding relation with earth is that of “vicegerency” which generates, as a consequence, another

relationship, namely “*exploitation*”, then there is the relation of “*taking warning*” from the signs of Allah SWT on earth. There is also the relation of “*life*” and “*death*”. There are two bonding relations between the righteous agents of the Tawhidi system and the *skies*, namely that of “*exploitation*” and that of “*taking warning*” as the following verses state:

﴿وَسَخَّرَ لَكُمْ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ جَمِيعًا مِنْهُ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يَعْقِلُونَ ١٣﴾ (الجاثية)

«*And He has subjected to you whatever is in the heavens and whatever is on the earth - all from Him. Indeed in that are signs for a people who give thought (13)*» (Al-Jathiya);

﴿قُلْ اَنْظُرُوا مَاذَا فِي السَّمَاوَاتِ وَالْأَرْضِ وَمَا تُعْطَى الْآيَاتُ وَالنُّذُرُ عَنْ قَوْمٍ لَا يُؤْمِنُونَ ١٠١﴾ (يونس)

«*Say, «Observe what is in the heavens and earth.» But of no avail will be signs or warners to a people who do not believe (101)*» (Yunus).

The most important bonding relations between the righteous believers in the Tawhidi social system and the environment of the invisible world is that with Satan. It is an enduring relationship based on *enmity* as Allah (SWT) has warned the *Mu'minin* in the Holy Qur'an and instructed them to take Satan as their enemy:

﴿إِنَّ الشَّيْطَانَ لَكُمْ عَدُوٌّ فَاتَّخِذُوهُ عَدُوًّا إِنَّمَا يَدْعُو حِزْبَهُ لِيَكُونُوا مِنْ أَصْحَابِ السَّعِيرِ ٦﴾ (فاطر)

«*Indeed, Satan is an enemy to you; so, take him as an enemy. He only invites his party to be among the companions of the Blaze (6)*» (Fatir).

Satan is the avowed enemy of all human beings but those who disbelieve in Allah (SWT) become the party of Satan and as such his war with them is over and all his efforts are directed to sway away the believers from the straight path. We have mentioned most of the general bonding relations with Satan when we discussed it in the above section related to the secular social system, so we will not repeat them here. However, within the particular relations with believers the Holy Quran mentions that of “*private conversation*”:

﴿إِنَّمَا النَّجْوَى مِنَ الشَّيْطَانِ لِيَحْزَنَ الَّذِينَ آمَنُوا وَلَيْسَ بِضَارِهِمْ شَيْئًا إِلَّا بِإِذْنِ اللَّهِ وَعَلَى اللَّهِ فَلْيَتَوَكَّلِ الْمُؤْمِنُونَ ١٠﴾ (المجادلة)

«Private conversation is only from Satan that he may grieve those who have believed, but he will not harm them at all except by permission of Allah. And upon Allah let the believers rely (10)» (Al-Mujadila).

I decided to ignore the relations with Jinn as a race and limit it to the particular clan of Iblis because the Holy Qur`an does not mention bonding relations between them and the righteous believers who constitute the Tawhidi social system. In fact, the Holy Qur`an tells us that even Satan has no authority over the righteous believers:

﴿فَإِذَا قَرَأْتَ الْقُرْآنَ فَاسْتَعِذْ بِاللَّهِ مِنَ الشَّيْطَانِ الرَّجِيمِ ٩٨﴾ ﴿إِنَّهُ لَيْسَ لَهُ سُلْطَانٌ عَلَى الَّذِينَ آمَنُوا وَعَلَى رَبِّهِمْ يَتَوَكَّلُونَ ٩٩﴾ (النحل)

« So when you recite the Qur`an, [first] seek refuge in Allah from Satan, the expelled [from His mercy] (98) Indeed, there is for him no authority over those who have believed and rely upon their Lord (99) » (An-Nahl).

The second bonding relations with the invisible world is that with the Angels and it is a relationship of “alliance”:

﴿نَحْنُ أَوْلِيَاؤُكُمْ فِي الْحَيَاةِ الدُّنْيَا وَفِي الْآخِرَةِ وَلَكُمْ فِيهَا مَا تَشْتَهِي أَنْفُسُكُمْ وَلَكُمْ فِيهَا مَا تَدَّعُونَ ٣١﴾ (فصلت)

«We [angels] were your allies in worldly life and [are so] in the Hereafter. And you will have therein whatever your souls desire, and you will have therein whatever you request [or wish] (31)» (Ha-Mim).

There is also the relationship of “strengthening”:

﴿إِذْ يُوحِي رَبُّكَ إِلَى الْمَلَائِكَةِ أَنِّي مَعَكُمْ فَثَبِّتُوا الَّذِينَ آمَنُوا سَأُلْقِي فِي قُلُوبِ الَّذِينَ كَفَرُوا الرُّعْبَ فَاضْرِبُوا فَوْقَ الْأَعْنَاقِ وَاضْرِبُوا مِنْهُمْ كُلَّ بَنَانٍ ١٢﴾ (الأنفال)

«[Remember] when your Lord inspired to the angels, «I am with you, so strengthen those who have believed. I will cast terror into the hearts of those who disbelieved, so strike [them] upon the necks and strike from them every fingertip.» (12)» (Al-Anfal).

There are another two general relations between humans and Angels but only believers in divine revelation are aware of them: those of “recording” and “watching”:

﴿أَمْ يَحْسَبُونَ أَنَّا لَا نَسْمَعُ سِرَّهُمْ وَنَجْوَاهُمْ بَلَىٰ وَرُسُلْنَا لَدَيْهِمْ يَكْتُبُونَ ۝٨٠﴾ (الزخرف)

«Or do they think that We hear not their secrets and their private conversations? Yes, [We do], and Our messengers are with them recording (80)» (Az-Zukhruf);

﴿مَا يَلْفِظُ مِنْ قَوْلٍ إِلَّا لَدَيْهِ رَقِيبٌ عَتِيدٌ ۝١٨﴾ (ق)

«does not utter a word except that it has a strong watcher 18» (Gaf).

The bonding relations between Allah (SWT) and the righteous believers in the Tawhidi social system are numerous and only a few of them can be mentioned here the most general of which are those of “alliance”; “love”; “prayer” and “mercy” as the following verses state:

﴿اللَّهُ وَلِيُّ الَّذِينَ آمَنُوا يُخْرِجُهُم مِّنَ الظُّلُمَاتِ إِلَى النُّورِ وَالَّذِينَ كَفَرُوا أَوْلِيَاؤُهُمُ الطَّاغُوتُ يُخْرِجُوهُمْ مِّنَ النُّورِ إِلَى الظُّلُمَاتِ أُولَئِكَ أَصْحَابُ النَّارِ هُمْ فِيهَا خَالِدُونَ ۝٢٥٧﴾ (البقرة)

«Allah is the ally of those who believe. He brings them out from darkness into the light. And those who disbelieve - their allies are Taghut. They take them out of the light into darkness. Those are the companions of the Fire; they will abide eternally therein 257)» (Al-Baqara);

﴿وَمِنَ النَّاسِ مَن يَتَّخِذُ مِن دُونِ اللَّهِ أَندَادًا يُحِبُّونَهُمْ كَحُبِّ اللَّهِ وَالَّذِينَ آمَنُوا أَشَدُّ حُبًّا لِلَّهِ وَلَوْ يَرَى الَّذِينَ ظَلَمُوا إِذْ يَرُونَ الْعَذَابَ أَنَّ الْقُوَّةَ لِلَّهِ جَمِيعًا وَأَنَّ اللَّهَ شَدِيدُ الْعَذَابِ ۝١٦٥﴾ (البقرة)

«And [yet], among the people are those who take other than Allah as equals [to Him]. They love them as they [should] love Allah. But those who believe are stronger in love for Allah. And if only they who have wronged would consider [that] when they see the punishment, [they will be certain] that all power belongs to Allah and that Allah is severe in punishment (165)» (Al-Baqara);

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا مَنْ يَرْتَدَّ مِنكُمْ عَن دِينِهِ فَسَوْفَ يَأْتِي اللَّهَ بِقَوْمٍ يُحِبُّهُمْ وَيُحِبُّونَهُ أَذِلَّةٌ عَلَى الْمُؤْمِنِينَ أَعَدَّةٌ عَلَى الْكَافِرِينَ يُجَاهِدُونَ فِي سَبِيلِ اللَّهِ وَلَا يَخَافُونَ لَوْمَةَ لَائِمٍ ذَلِكَ فَضْلُ اللَّهِ يُؤْتِيهِ مَن يَشَاءُ وَاللَّهُ وَاسِعٌ عَلِيمٌ ۝٥٤﴾ (المائدة)

«O you who have believed, whoever of you should revert from his religion - Allah will bring forth [in place of them] a people He will love and who will love Him [who are] humble toward the believers, powerful against the disbelievers; they strive in the cause of Allah and do not fear the blame of a critic. That is the favor of Allah; He

bestows it upon whom He wills. And Allah is all-Encompassing and Knowing (54)» (Al-Maidah);

﴿هُوَ الَّذِي يُصَلِّي عَلَيْكُمْ وَمَلَائِكَتُهُ لِيُخْرِجَكُم مِّنَ الظُّلُمَاتِ إِلَى النُّورِ وَكَانَ بِالْمُؤْمِنِينَ رَحِيمًا ٤٣﴾ (الأحزاب)

«It is He who confers blessing upon you, and His angels [ask Him to do so] that He may bring you out from darkness into the light. And ever is He, to the believers, Merciful (43)» (*Al-Ahzab*);

In general, all the divine attributes constituting the soul system and therefore, a component in the self system are bonding relations between the righteous believers in the Tawhidi social system and Allah (SWT), the source of these attributes.

5.4- How the Tawhidi Social System Works- its mechanisms

Social mechanisms, within the materialist framework of explanation, are the pathways taken by social actions through the social structure to link causes and their consequences in the social system. This is the mechanistic (deep) explanation for how the social system works to perform its functions, or for the events that take place in the context of continuous systemic change. This mechanistic explanation is deeper than the usual causal explanation followed in the natural and social sciences because it explains how a particular cause generates its consequences. Hence, the mechanistic explanation is not a substitute for the causal explanation, rather it deepens it. However, causality itself has a metaphysical, or transcendental dimension within the framework of the Qur`anic worldview (QWV) as we have seen from our analyses of the social systems derived from it. This is the real challenge facing scientific explanation for social phenomena grounded on QWV, because humans are not the only active actors in the social system but there are other unobservable actors whose actions are intertwined with human actions such that the functioning of the system and the events that take place inside it cannot be causally exhausted by human actions alone. There are parallel and opposite pathways followed by entities from the invisible world, e.g., Satan, through which they influence humans and their actions and therefore, the consequences of these social actions. There are also the pervasive celestial pathways through which divine ordinance influences human social processes and their consequences. The epistemological and methodological challenge

for Islamic scientific scholarship is how to integrate these transcendental factors in a meaningful scientific explanation for social phenomena.

There are general internal social mechanisms at work within the social structure that binds the righteous actors in the Tawhidi social system, e.g., “brotherhood”; “cooperation” “enjoining good and forbidding bad”; “consultation”; “advice”; “love”; “trust”; “equality”; “humility”; “support”; “piety”; “mercy”; “reform”; ...etc. There are mechanisms which are domain specific, e.g., in the economic domain some of the mechanisms are “mutual consent”; “justice in weight”; “fair competition”; “hisba”; “borrowing”; “inheritance”; “zakah” etc.; “charity” etc. Similar mechanisms are found in the kinship, cultural and political domains.

The external mechanisms that are at work within the bonding relations between the Tawhidi social system and its environment in the visible world are those relating to the material entities (earth, skies) and to the conceptual entity (Revelation). With respect to earth the bond of vicegerency is critical in determining the type of social mechanisms that will enable the righteous actors to carry out their responsibilities in a manner such that they enjoy the bounties of Allah (SWT) without corrupting the earth, thus satisfy the condition of “thankfulness” for these bounties. Some of these mechanisms are “reformation”; “settlement”; “thankfulness”; “balance maintenance”; “contemplation” ...etc.

The same mechanisms that work in the relationship between the actors of the Tawhidi social system and earth also govern the processes between them and the skies, the second component of the environment of the visible world. This is because both entities are harnessed for exploitation by man and both could be susceptible to corruption by his whims:

﴿وَلَوْ اتَّبَعَ الْحَقُّ أَهْوَاءَهُمْ لَفَسَدَتِ السَّمَاوَاتُ وَالْأَرْضُ وَمَنْ فِيهِنَّ بَلْ أَتَيْنَاهُمْ بِذِكْرِهِمْ فَهُمْ عَنْ ذِكْرِهِمْ مُعْرِضُونَ ﴿٧١﴾
(المؤمنون)

«But if the Truth had followed their inclinations, the heavens and the earth and whoever is in them would have been ruined. Rather, We have brought them their message, but they, from their message, are turning away (71)» al-Mouminun).

Revelation is the most important component of the visible world from the perspective of the actors of the Tawhidi social system because it is the source

of their knowledge about their *Iman*, their social goals in life and their good work to achieve them. Therefore, there are mechanisms that are continuously working through the relations that bind the righteous actors with Revelation to preserve the social system and to keep its evolution on course along the straight path. This will be possible through the continuous *progress* of the actors constituting the social system by following the teachings of Revelation which will condition their actions and interactions. Thus, the actors will continuously increase in knowledge, *Iman* and good work. Some of the most important mechanisms that cement this relationship between actors and Revelation are “recitation”; “meditation”; “attentive listening”; “learning”; “cure”; “remembrance”; “firm holding” etc.

These mechanisms which work to strengthen the relations between actors and Revelation work in both directions where the initiative comes from the actors who seek guidance and because Revelation is not any conceptual or semiotic system, but the word of Allah (SWT). There are reciprocal mechanisms that generate positive spiritual effects both at the physiological and psychological levels:

﴿اللَّهُ نَزَّلَ أَحْسَنَ الْحَدِيثِ كِتَابًا مُتَشَابِهًا مَثَابًا تَتَشَعَّرُ مِنْهُ جُلُودُ الَّذِينَ يَخْشَوْنَ رَبَّهُمْ ثُمَّ تَلِينُ جُلُودُهُمْ وَقُلُوبُهُمْ إِلَىٰ ذِكْرِ اللَّهِ ذَٰلِكَ هُدَىٰ اللَّهِ يَهْدِي بِهِ مَن يَشَاءُ وَمَن يُضَلِلِ اللَّهُ فَمَا لَهُ مِن هَادٍ ﴿٢٣﴾ (الزمر)

«Allah has sent down the best statement: a consistent Book wherein is reiteration. The skins shiver therefrom of those who fear their Lord; then their skins and their hearts relax at the remembrance of Allah. That is the guidance of Allah by which He guides whom He wills. And one whom Allah leaves astray - for him there is no guide (23)» (Az-Zumar).

Mario Bunge, a distinguished philosopher of scientific realism, takes it for granted that conceptual systems have no mechanisms because change requires energy which conceptual systems lack. Only material systems have energy, therefore, have mechanisms. Whatever effects conceptual and semiotic systems have on humans should be attributed to the material neurological processes in the human brain. It is through neurological processes that conceptual and semiotic systems are generated and interpreted. However, this denial of causation beyond the material is unwarranted according to QWV because levels of reality are causally interdependent and divine spiritual energy (soul) is an integral part of reality, particularly human reality. The Holy Qur`an is a

divine inspiration, therefore a spiritual energy, brought down by Allah SWT to man and He is the guarantor of its integrity and authenticity. The Holy Qur`an as a conceptual system has become part of visible reality, accessible by all humans and when man interacts with it seeking knowledge, guidance and healing he is also interacting directly with the source of the Qur`an, Allah (SWT), Who, then bestows the relevant causal effects coming from the sacred book:

﴿وَكَذَلِكَ أَوْحَيْنَا إِلَيْكَ رُوحًا مِنْ أَمْرِنَا مَا كُنْتَ تَدْرِي مَا الْكِتَابُ وَلَا الْإِيمَانُ وَلَكِنْ جَعَلْنَاهُ نُورًا نَهْدِي بِهِ مَنْ نَشَاءُ مِنْ عِبَادِنَا وَإِنَّكَ لَتَهْدِي إِلَى صِرَاطٍ مُسْتَقِيمٍ ٥٢﴾ (الشورى)

«And thus, We have revealed to you an inspiration of Our command. You did not know what is the Book or [what is] faith, but We have made it a light by which We guide whom We will of Our servants. And indeed, [O Muhammad], you guide to a straight path (52)» (Ash-Shura);

﴿وَنُنَزِّلُ مِنَ الْقُرْآنِ مَا هُوَ شِفَاءٌ وَرَحْمَةٌ لِّلْمُؤْمِنِينَ وَلَا يَزِيدُ الظَّالِمِينَ إِلَّا خَسَارًا ٨٢﴾ (الإسراء)

«And We send down of the Qur`an that which is healing and mercy for the believers, but it does not increase the wrongdoers except in loss (82)» (Israel).

The piety acquired by the actors from this reciprocal mechanistic interaction with revelation triggers further mechanisms of good works in all domains of earthly life, particularly those in the domain of wealth, with rewarding consequences:

﴿وَلَوْ أَنَّهُمْ أَقَامُوا التَّوْرَةَ وَالْإِنْجِيلَ وَمَا أَنْزَلْنَا إِلَيْهِمْ مِنَ الرِّبِّهِمْ لَآكَلُوا مِنْ فَوْقِهِمْ وَمِن تَحْتِ أَرْجُلِهِمْ مِنْهُمْ أُمَّةٌ مُّقْتَصِدَةٌ وَكَثِيرٌ مِنْهُمْ سَاءَ مَا يَعْمَلُونَ ٦٦﴾ (المائدة)

«And if only they upheld [the law of] the Torah, the Gospel, and what has been revealed to them from their Lord, they would have consumed [provision] from above them and from beneath their feet. Among them are a moderate community, but many of them - evil is that which they do (66)» (Al-Maidah).

The most important mechanisms in the relationship between the Tawhidi social system and its environment in the invisible world is that with Satan. We have already discussed the potent mechanisms used by the Satan to sway people from the straight path in our discussion of the secular social system,

therefore, here we mention those counter mechanisms used by the righteous actors to keep the Satan at bay in the Tawhidi social system. The most potent mechanisms mentioned in the Holy Qur`an are “seeking refuge in Allah (SWT)”;
 “Iman”; “reliance on Allah (SWT)”:

﴿فَإِذَا قَرَأْتَ الْقُرْآنَ فَاسْتَعِذْ بِاللَّهِ مِنَ الشَّيْطَانِ الرَّجِيمِ ٩٨﴾ ﴿إِنَّهُ لَيْسَ لَهُ سُلْطَانٌ عَلَى الَّذِينَ آمَنُوا وَعَلَى رَبِّهِمْ يَتَوَكَّلُونَ ٩٩﴾ ﴿إِنَّمَا سُلْطَانُهُ عَلَى الَّذِينَ يَتَوَلَّوْنَهُ وَالَّذِينَ هُمْ بِهِ مُشْرِكُونَ ١٠٠﴾ (النحل)

«So when you recite the Qur`an, [first] seek refuge in Allah from Satan, the expelled [from His mercy] (98) Indeed, there is for him no authority over those who have believed and rely upon their Lord (99) His authority is only over those who take him as an ally and those who through him associate others with Allah (100)» (An-Nahl).

Then there is the potent counter mechanism of “zikr Allah” mediated through ‘prayer’; “fasting”; “zakat”; “pilgrimage”; “recitation of Qur`an”, “tasbeeh” etc.

The other entity in the invisible environment of the Tawhidi social system with which the actors of the social system interact are Angels and the mechanisms involved are (top-down) from Angels to the righteous actors. The overarching mechanism is that of “alliance”:

﴿نَحْنُ أَوْلِيَاؤُكُمْ فِي الْحَيَاةِ الدُّنْيَا وَفِي الْآخِرَةِ وَلَكُمْ فِيهَا مَا تَشْتَوْنَ أَنفُسُكُمْ وَلَكُمْ فِيهَا مَا تَدْعُونَ ٣١﴾ (فصلت)

«We [angels] were your allies in worldly life and [are so] in the Hereafter. And you will have therein whatever your souls desire, and you will have therein whatever you request [or wish] (31)» (Ha-Mim).

Fig 3 gives us a detailed topology of the ontological entities of the QWV including Jannah and Jahannam. Jannah and Jahannam have no direct causal relationship with the agents of the Tawhidi social system but being defined and presented by the Holy Qur`an as the ultimate and eternal abode of all human beings, depending on the nature of their actions in this world, exert an immense enabling and constraining psychological influence on the righteous agents of the system. In this way Jannah and Jahannam increase the commitment by actors to righteous social actions and interactions thus, adding to the efficacy of the social relations bonding the Tawhidi social system. This should influence the choice by actors of those essential social mechanisms that bring maximum effectiveness to their actions and the consequent effects on the functioning of the Tawhidi social system.

The mechanistic processes that operate to expand, vertically and horizontally, the relationship between Allah (SWT) and the actors of the Tawhidi social system are numerous and they are “bottom-up” from the actors and “top-down” from Him, augmenting the effects of each other. The most pervasive “bottom-up” general mechanism that pervades the endo and exo structure of the social system is that of “Iman” and reciprocated by the “top-down” mechanisms of “security” and “righteous guidance”:

﴿الَّذِينَ آمَنُوا وَلَمْ يَلْبِسُوا إِيمَانَهُمْ بِظُلْمٍ أُولَئِكَ لَهُمُ الْأَمْنُ وَهُمْ مُهْتَدُونَ﴾ ﴿٨٢﴾ (الأنعام)

«They who believe and do not mix their belief with injustice - those will have security, and they are [rightly] guided (82)» (Al-An’am).

Another pervasive “bottom-up” mechanism is that of “piety” which is reciprocated by the equally pervasive “top-down” mechanism of “good tidings”:

﴿الَّذِينَ آمَنُوا وَكَانُوا يَتَّقُونَ﴾ ﴿٦٣﴾ ﴿لَهُمُ الْبُشْرَىٰ فِي الْحَيَاةِ الدُّنْيَا وَفِي الْآخِرَةِ لَا تَبْدِيلَ لِكَلِمَاتِ اللَّهِ ذَلِكَ هُوَ الْفَوْزُ الْعَظِيمُ﴾ ﴿٦٤﴾ (يونس)

«Those who believed and were fearing Allah (63) For them are good tidings in the worldly life and in the Hereafter. No change is there in the words of Allah. That is what is the great attainment (64)» (Yunus).

There is also the potent “bottom-up” mechanism of “supplication” and its reciprocal “top-down” mechanism of “response”:

﴿وَقَالَ رَبُّكُمْ ادْعُونِي أَسْتَجِبْ لَكُمْ إِنَّ الَّذِينَ يَسْتَكْبِرُونَ عَنْ عِبَادَتِي سَيَدْخُلُونَ جَهَنَّمَ دَاخِرِينَ﴾ ﴿٦٠﴾ (غافر)

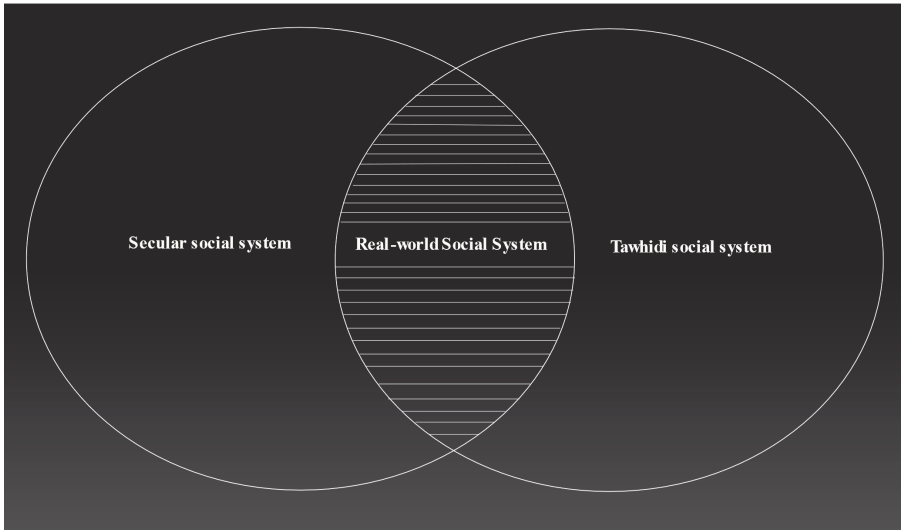
«And your Lord says, «Call upon Me; I will respond to you.» Indeed, those who disdain My worship will enter Hell [rendered] contemptible (60)» (Al-Mu’min).

These examples give us an idea about the countless and pervasive processes and pathways through which the relationship between Allah (SWT) and His righteous servants work, thus, making the Tawhidi social system effective in carrying its functions.

6 - The Hybrid Real-world Social System

Fig. 6 depicts the model of the real-world social system which lies at the boundary area where the secular and the Tawhidi social systems intersect. It is the union of these two limits of the natural social system. This is because social systems are open systems and as such can be interpenetrated by neighboring social systems which are its immediate environment at the horizontal level. There are numerous ways by which such interpenetration takes place, most obvious among them in our contemporary world is cyberspace via social media. Therefore, the real-world social system is always the result of the boundary interaction between the secular and Tawhidi social systems, and can be dominated by the characteristics of either system depending on their continuous tide-ebb relationship. However, the two systems may remain distinct and only contact each other at the boundary, particularly if they are situated in geographical areas in time and space which will allow the study of international relations.

Fig. 6: Real-World Social System



6.1 - Components of the Hybrid System

The real-world social system is composed of the components (actors) of the secular and Tawhidi social systems. It is important to point out that all humans share the same self system in terms of transgressing and piety properties but for each individual this system of properties is structured differently depending on his worldview and his actions in real-life situations. From this perspective each individual is a unique self but they can be broadly classified according to QWV into *Mu'minin*, *Munafiqin*, *Mushrikin* and *Kafirin*.

Each category of these actors can be further subdivided, e.g., there are the real-world *Mu'minin* with their different classifications as narrated by the Holy Qur'an: "*he who wrongs himself*"; "*he who is moderate*"; "*he who is foremost in good deeds*":

﴿ثُمَّ أَوْرَثْنَا الْكِتَابَ الَّذِينَ اصْطَفَيْنَا مِنْ عِبَادِنَا فَمِنْهُمْ ظَالِمٌ لِنَفْسِهِ وَمِنْهُمْ مُقْتَصِدٌ وَمِنْهُمْ سَابِقٌ بِالْخَيْرَاتِ إِذْنُ اللَّهِ ذَلِكَ هُوَ الْفَضْلُ الْكَبِيرُ ﴿٣٢﴾ (فاطر)

«Then we caused to inherit the Book those We have chosen of Our servants; and among them is he who wrongs himself, and among them is he who is moderate, and among them is he who is foremost in good deeds by permission of Allah. That [inheritance] is what is the great bounty (32)» (Fatir).

Thus, we may have a real-world social system composed entirely of *Mu'minin*, who belong to these three categories and some of their actions and interactions exhibit secular features at the micro level and generate secular social relations in all the main social subsystems at the macro level. This is because secularism as a worldview has its germ in the self system of every human being given the dual transgression and piety properties of the self. Thus, if the category of those whom the Holy Qur'an described as "*he who wrongs himself*" is dominant in a real-world hybrid social system then this system, though composed of only *Mu'minin*, will exhibit secular characteristics.

Each of these six categories has its psychological characteristics and social goals but they all share the same social system with its visible and invisible environments, and with its relationship with Allah (SWT). They act and interact with each other, thus generating various types of influences on each other. This social system with its unique diversified composition of actors is

a formidable methodological challenge to system research grounded on the Qur`anic worldview (QWV), but at the same time it is a rich mine of research for all types of social problems in contemporary societies, including those known as “boundary problems” resulting from diversity in the same society or in neighboring societies; e.g., “religious”; “cultural”; “ethnic”; “class”; “gender” etc.

The reason for this assumed methodological richness in QWV-based systems social research dates back to the first instance of human society started in the invisible world before being concretized on earth in the visible world. In its first beginnings the germ of human societies was a Tawhidi society, though consisting of only one couple, *Adam* and *Hawwa*, peace be upon them, but this mini Tawhidi society was soon to be penetrated by the neighboring society of Jinn, namely by Iblis:

﴿وَلَقَدْ عَهِدْنَا إِلَىٰ آدَمَ مِنْ قَبْلِ أَنْ نُنزِّلَهُ الْفَلَاقَ أَن سَاجِدَ لِلَّذِينَ لَدُنَّا مِنَّا سُجَّدًا بِإِذْنِ ابْنِ آدَمَ إِلَّا ابْنِ الشَّيْطَانِ ﴿١١٥﴾ ﴿وَإِذْ قُلْنَا لِلْمَلَائِكَةِ اسْجُدُوا لِآدَمَ فَسَجَدُوا إِلَّا إِبْلِيسَ أَبَى ﴿١١٦﴾ ﴿فَقُلْنَا يَا آدَمُ إِنَّ هَذَا عَدُوٌّ لَكَ وَلِزَوْجِكَ فَلَا يُخْرِجَنَّكَمَا مِنَ الْجَنَّةِ فَتَشْقَى ﴿١١٧﴾ ﴿إِنَّ لَكَ أَلًا تَجُوعُ فِيهَا وَلَا تَعْرِى ﴿١١٨﴾ ﴿وَأَنَّكَ لَا تَظْمَأُ فِيهَا وَلَا تَصْحَى ﴿١١٩﴾ ﴿فَوَسْوَسَ إِلَيْهِ الشَّيْطَانُ قَالَ يَا آدَمُ هَلْ أَدُلُّكَ عَلَىٰ شَجَرَةِ الْخُلْدِ وَمُلْكٍ لَّا يَبُلَىٰ ﴿١٢٠﴾ ﴿فَأَكَلَا مِنْهَا فَبَدَتْ لَهُمَا سَوْآتُهُمَا وَطَفِقَا يَخْصِفَانِ عَلَيْنِمَا مِنْ وَرَقِ الْجَنَّةِ وَعَصَى آدَمُ رَبَّهُ فَغَوَى ﴿١٢١﴾ (طه)

«And We had already taken a promise from Adam before, but he forgot; and We found not in him determination (115) And [mention] when We said to the angels, “Prostrate to Adam,” and they prostrated, except Iblees; he refused (116) So We said, “O Adam, indeed this is an enemy to you and to your wife. Then let him not remove you from Paradise so you would suffer (117) Indeed, it is [promised] for you not to be hungry therein or be unclothed (118) And indeed, you will not be thirsty therein or be hot from the sun.” (119) Then Satan whispered to him; he said, “O Adam, shall I direct you to the tree of eternity and possession that will not deteriorate?” (120) And Adam and his wife ate of it, and their private parts became apparent to them, and they began to fasten over themselves from the leaves of Paradise. And Adam disobeyed his Lord and erred (121)» (Ta-ha).

Thus, no matter how rich the diversification of human societies looks today it can all be traced back, methodologically, to a bifurcation in the evolution of the Tawhidi social system where the system is knocked out of its self-organizing Iman attractor. In plain language, the social system diverted from the straight path of its evolution as a result of nonconforming actions and interactions at the micro level of its human components.

On earth the points of bifurcation increased and diverse forms of human social systems, Tawhidi and secular, emerged and multiplied. These different forms of social systems then become interacting neighboring systems, resulting in hybrid real-world social systems represented at the micro level by the six categories of their actors; the three of the Tawhidi social system: “he who wrongs himself”; “he who is moderate”; “he who is foremost in good deeds”; and the three of the secular social system: “kafir”; “mushrik”; and “munafiq”.

The Holy Qur`an warned against such possibilities that multiply the ways on both sides of the straight path:

﴿وَأَنَّ هَذَا صِرَاطِي مُسْتَقِيمًا فَاتَّبِعُوهُ وَلَا تَتَّبِعُوا السُّبُلَ فَتَفَرَّقَ بِكُمْ عَنْ سَبِيلِهِ ذَلِكُمْ وَصَّاكُمْ بِهِ لَعَلَّكُمْ تَتَّقُونَ ١٥٣﴾
(الأنعام)

And, [moreover], this is My path, which is straight, so follow it; and do not follow» [other] ways, for you will be separated from His way. This has He instructed you that .(you may become righteous (153)) (Al-An'am

This primordial penetration of the Tawhidi social system, followed by diversification and separation of social systems, though started by Satan playing on Adams` weakness of will, is now effected by a combination of Satanic mechanisms and human weakness of will with respect to worldly pleasures of wealth and children. However, it is for this very difference and diversity that Allah (SWT) created man with free will, endowed him with earthly resources over which such free will is exercised, showed him His way and commanded him not to go astray:

﴿وَلَوْ شَاءَ رَبُّكَ لَجَعَلَ النَّاسَ أُمَّةً وَاحِدَةً وَلَا يَزَالُونَ مُخْتَلِفِينَ ٨١١﴾ ﴿إِلَّا مَنْ رَحِمَ رَبُّكَ وَلِذَلِكَ خَلَقَهُمْ وَتَمَّتْ كَلِمَةُ رَبِّكَ لَأُمَمًا نَّجِبَةً وَالنَّاسِ أَجْمَعِينَ ١١٩﴾ (هود)

«And if your Lord had willed, He could have made mankind one community; but they will not cease to differ (118) Except whom your Lord has given mercy, and for that He created them. But the word of your Lord is to be fulfilled that, “I will surely fill Hell with jinn and men all together.” (119)» (Hud).

The assumption of revelation being brought down to social actors on earth and the sending of messengers by Allah (SWT) makes a substantial difference in the analysis of this hybrid real-world social system compared to the secular

and Tawhidi social systems. While, by assumption, the secular social system is composed of actors who are all “*kafir*” because they rejected the divine message, therefore, all their actions are bad and transgressing, and the actors in the Tawhidi social system are all “*Mu’min*” because they accepted the divine message, therefore, all their actions are good and righteous, the hybrid real-world social system is composed of actors some of whom are *kafir*, whose deeds are all bad from the perspective of Shari`ah, and others are *Mu’min* who sometimes do good and sometimes do bad deeds:

﴿وَأَخْرُونَ اعْتَرَفُوا بِذُنُوبِهِمْ خَلَطُوا عَمَلًا صَالِحًا وَآخَرَ سَيِّئًا عَسَىٰ اللَّهُ أَنْ يَتُوبَ عَلَيْهِمْ إِنَّ اللَّهَ غَفُورٌ رَحِيمٌ ١٠٢﴾ (التوبة)

«And [there are] others who have acknowledged their sins. They had mixed a righteous deed with another that was bad. Perhaps Allah will turn to them in forgiveness. Indeed, Allah is Forgiving and Merciful (102)» (At-Tauba).

The good work itself has different grades from the perspective of Shari`ah: “*wagib*”; “*mandub*” and “*mubah*”; and the bad work is also graded into “*makrooh*”; and “*haram*”. The *haram* deed is further classified into types e.g., “*fahisha*”; “*fahisha and mugta*”; “*munkar*”; “*baghy*”. That is why the *Mu’minin* in the hybrid social system are ranked and rewarded differently by Allah (SWT) in this world and in the hereafter.

The *Kafirin* in this hybrid social system are also different types, though they are together in that all their deeds are classified as bad by shari`ah, e.g., there are *hypocrites* who are closer to *kufr*, and other hypocrites who are accustomed to hypocrisy. Then there are those who declare their *kufr*, and there are those who are *mushrikin*. Each type of these actors has different psychological properties according to which they act and interact in the hybrid social system which affects its functioning.

The scenarios of the concrete different social systems representative of this hybrid real-world system are limitless because, e.g., change in demographic percentages, or in religious, ethnic and cultural affiliation, or even different interpretation of sacred texts and scriptures leads to change in the *composition*, *environmental relations*, *structure* and *mechanisms* of the hybrid social system, and as a result in the dynamics of change and their consequences. The Holy Qur`an gives us many historical examples of the concrete manifestations of this hybrid social system where we have the prophets and their followers on

the one side and the rest of the society on the other side. A good example of this historical manifestation is that of prophet Muhammad- peace be upon him- and his companions during the Mecca era and that of Madinah. In fact, our own contemporary times and the myriads of problems which humanity is facing are the best concrete manifestations of this hybrid social system.

6.2- Environment of the Hybrid Social System

Fig. 6 shows that two additional environments are added in the hybrid social system over and above those in the other social systems, namely the secular social system and the Tawhidi social system. The hybrid social system is embedded in these two systems at the conceptual level, as two separate worldviews exerting in a continuous manner their impact on the psychology of the different actors of the hybrid system. We can liken their existence to the separate existence of Revelation we mentioned earlier, since they manifest themselves in various forms through the activities of their advocates, e.g., as public cultural manifestations, as knowledge conveyed through the different educational systems, as books, audio, video and other multimedia platforms. Only a limited representation of the totality of each system is inscribed in the psychology of each of their adherents, which means that the system in its totality will remain an indispensable reference tacitly exerting its influence on its own adherents and on the adherents of the other system.

The hybrid real-world social system emerges from the boundary interactions of the secular and Tawhidi social systems, they continue to interact with it and exert their influence in all its aspects. It is this interaction and influence coming simultaneously from both systems which lead to the emergence of the other categories of actors defined by the Holy Qur`an beside Kafir and Mu`min. Both properties of transgression and piety are now active in the self system of the Mu`min. If the effects coming from any of these two primary systems are stronger than those coming from the other system then the hybrid social system is likely to *evolve* towards the dominating social system. This evolution may take place in a peaceful *tacit* manner, or through some mechanisms of purposeful *reform*, or through some coercive mechanisms, e.g., *revolution*, *coup d'état* ...etc. Two, or more hybrid social systems may be geographically separated but socially interconnected through horizontal dependence, particularly in the wealth subsystem, in which case even *war* may become a mechanism of change beside the above ones.

6.3 - Structure of the Hybrid Social System

The bonding endostructure of the hybrid social system depends on the scenario assumed by the researcher, however in general, each type of actors will have own relations between its members and relations with other types of actors sharing the system. We have mentioned the bonds that relate the *Mu'minin* to each other when discussing the Tawhidi social system, however, in this real-world hybrid social system we do not have an ideal type *Mu'min* but myriads of real-world *Mu'minin*, who may even have hostile relations between them resulting from sectarian affiliations, or relations of dominance and exploitation in the wealth subsystem. These are nuances we don't have the luxury to go into but it shows the complexity of the real-world social phenomena that Islamic scholarship in the social sciences has to deal with.

Let us consider here some of the *Mu'min* relations with other types of actors in the hybrid social system. There are the bonding relations of "beneficence" and "fairness":

﴿لَا يَنْهَاكُمُ اللَّهُ عَنِ الَّذِينَ لَمْ يُقَاتِلُوكُمْ فِي الدِّينِ وَلَمْ يُخْرِجُوكُمْ مِنْ دِيَارِكُمْ أَنْ تَبَرُّوهُمْ وَتُقْسِطُوا إِلَيْهِمْ إِنَّ اللَّهَ يُحِبُّ الْمُقْسِطِينَ﴾
(الممتحنة) ٨

«Allah does not forbid you from those who do not fight you because of religion and do not expel you from your homes - from being righteous toward them and acting justly toward them. Indeed, Allah loves those who act justly (8)» (Al-Mumtahana).

There are the bonds of "justice" and "benevolence":

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا كُونُوا قَوَّامِينَ لِلَّهِ شُهَدَاءَ بِالْقِسْطِ وَلَا يَجْرِمَنَّكُمْ شَنَاَنُ قَوْمٍ عَلَىٰ أَلَّا تَعْدِلُوا اعْدِلُوا هُوَ أَقْرَبُ لِلتَّقْوَىٰ وَاتَّقُوا اللَّهَ إِنَّ اللَّهَ خَبِيرٌ بِمَا تَعْمَلُونَ﴾ ٨ (المائدة)

«O you who have believed, be persistently standing firm for Allah, witnesses in justice, and do not let the hatred of a people prevent you from being just. Be just; that is nearer to righteousness. And fear Allah; indeed, Allah is Acquainted with what you do (8)» (Al-Maidah);

﴿إِنَّ اللَّهَ يَأْمُرُ بِالْعَدْلِ وَالْإِحْسَانِ وَإِيتَاءِ ذِي الْقُرْبَىٰ وَيَنْهَىٰ عَنِ الْفَحْشَاءِ وَالْمُنْكَرِ وَالْبَغْيِ يَعِظُكُمْ لَعَلَّكُمْ تَذَكَّرُونَ﴾ ٩٠
(النحل)

«Indeed, Allah orders justice and good conduct and giving to relatives and forbids immorality and bad conduct and oppression. He admonishes you that perhaps you will be reminded (90)» (An-Nahl).

There are, however, the relations of “honor, power, might” when there is a need for them:

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا مَنْ يَرْتَدَّ مِنْكُمْ عَنْ دِينِهِ فَسَوْفَ يَأْتِي اللَّهَ بِقَوْمٍ يُحِبُّهُمْ وَيُحِبُّونَهُ أَذِلَّةٌ عَلَى الْمُؤْمِنِينَ أَعِزَّةٌ عَلَى الْكَافِرِينَ يُجَاهِدُونَ فِي سَبِيلِ اللَّهِ وَلَا يَخَافُونَ لَوْمَةَ لَائِمٍ ذَلِكَ فَضْلُ اللَّهِ يُؤْتِيهِ مَنْ يَشَاءُ وَاللَّهُ وَاسِعٌ عَلِيمٌ ٥٤﴾ (المائدة)

«O you who have believed, whoever of you should revert from his religion - Allah will bring forth [in place of them] a people He will love and who will love Him [who are] humble toward the believers, powerful against the disbelievers; they strive in the cause of Allah and do not fear the blame of a critic. That is the favor of Allah; He bestows it upon whom He wills. And Allah is all-Encompassing and Knowing (54)» (Al-Maidah.).

﴿هَا أَنْتُمْ أَوْلَاءُ تُحِبُّونَهُمْ وَلَا يُحِبُّونَكُمْ وَتُؤْمِنُونَ بِالْكِتَابِ كُلِّهِ وَإِذَا لَقُوا أَخِيكُمْ قَالُوا أَمَنَّا وَإِذَا خَلَوْا عَنِكَمُ الْأُنَاسِ مِنَ الْغَيْبِ قُلْ مُؤْمِنُوا بِغَيْظِكُمْ إِنَّ اللَّهَ عَلِيمٌ بِذَاتِ الصُّدُورِ ١١٩﴾ ﴿إِنْ تَمَسَّسْتُمْ حَسَنَةً تَسْؤُهُمْ وَإِنْ تُصِيبْكُمْ سَيِّئَةٌ يَفْرَحُوا بِهَا وَإِنْ تَصِيبُوا وَتَتَّقُوا لَا يَضُرُّكُمْ كَيْدُهُمْ شَيْئًا إِنَّ اللَّهَ بِمَا يَعْمَلُونَ مُحِيطٌ ١٢٠﴾ (آل عمران)

«Here you are loving them but they are not loving you, while you believe in the Scripture - all of it. And when they meet you, they say, «We believe.» But when they are alone, they bite their fingertips at you in rage. Say, «Die in your rage. Indeed, Allah is Knowing of that within the breasts.» (119) If good touches you, it distresses them; but if harm strikes you, they rejoice at it. And if you are patient and fear Allah, their plot will not harm you at all. Indeed, Allah is encompassing of what they do (120)» (Al-i-Imran)

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا لَا تَتَّخِذُوا الْيَهُودَ وَالنَّصَارَى أَوْلِيَاءَ بَعْضُهُمْ أَوْلِيَاءُ بَعْضٍ وَمَنْ يَتَوَلَّهُمْ مِنْكُمْ فَإِنَّهُ مِنْهُمْ إِنَّ اللَّهَ لَا يَهْدِي الْقَوْمَ الظَّالِمِينَ ٥١﴾ (المائدة)

«O you who have believed, do not take the Jews and the Christians as allies. They are [in fact] allies of one another. And whoever is an ally to them among you - then indeed, he is [one] of them. Indeed, Allah guides not the wrongdoing people (51)» (Al-Maidah)

There are the relations between the *kafir* depending on to which category

the actors belong, and between them and the *Moumin*. We leave the details of these relations to future research by the present researcher or by others, however the following verses are relevant here:

﴿وَالَّذِينَ كَفَرُوا بَعْضُهُمْ أَوْلِيَاءُ بَعْضٍ إِلَّا تَفْعَلُوهُ تَكُنْ فِتْنَةً فِي الْأَرْضِ وَفَسَادًا كَبِيرًا ٧٣﴾ (الأنفال)

«And those who disbelieved are allies of one another. If you do not do so, there will be fitnah on earth and great corruption (73)» (Al-Anfal);

﴿الْمُتَافِقُونَ وَالْمُتَافِقَاتُ بَعْضُهُمْ مِنْ بَعْضٍ يَأْمُرُونَ بِالْمُنْكَرِ وَيَنْهَوْنَ عَنِ الْمَعْرُوفِ وَيَقْبِضُونَ أَيْدِيَهُمْ نَسُوا اللَّهَ فَنَسِيهِمْ إِنَّ الْمُنَافِقِينَ هُمُ الْفَاسِقُونَ ٦٧﴾ (التوبة)

«The hypocrite men and hypocrite women are of one another. They enjoin what is wrong and forbid what is right and close their hands. They have forgotten Allah, so He has forgotten them [accordingly]. Indeed, the hypocrites - it is they who are the defiantly disobedient (67)» (At-Tauba);

﴿لَا يُقَاتِلُونَكُمْ جَمِيعًا إِلَّا فِي قُرَى مُحَصَّنَةٍ أَوْ مِنْ وَرَاءِ جُدُرٍ بَأْسُهُمْ بَيْنَهُمْ شَدِيدٌ تَحْسَبُهُمْ جَمِيعًا وَقُلُوبُهُمْ شَتَّى ذَلِكَ بِأَنَّهُمْ قَوْمٌ لَا يَعْقِلُونَ ١٤﴾ (الحشر)

«They will not fight you all except within fortified cities or from behind walls. Their violence among themselves is severe. You think they are together, but their hearts are diverse. That is because they are a people who do not reason (14)» (Al-Hashr).

There is the bonding exo structure between the components of the hybrid social system and the environment in the observable world (Revelation, earth, skies), but it depends on the type of actors whether they are *Mu'min*, or *kafir*. We have mentioned the relations between the *Mu'min* and Revelation when discussing the Tawhidi social system but in this hybrid social system we have a new dimension to this relation because of the interaction between the *Mu'min* and *Kafir*, e.g., the relation of making *jihad* with the Holy Qur'an to invite nonbelievers to believe:

﴿فَلَا تُطِعِ الْكَافِرِينَ وَجَاهِدْهُمْ بِهِ جِهَادًا كَبِيرًا ٥٢﴾ (الفرقان)

«So do not obey the disbelievers, and strive against them with the Qur'an a great striving (52)» (Al-Furqan).

There is also a bonding relation between Muslim scholars and the Holy Qur`an to make *ijtihad* that produces knowledge relevant to all types of contemporary problems and challenges arising from the social dynamics of the hybrid social system in time and space:

﴿أَفَلَا يَتَذَكَّرُونَ الْقُرْآنَ وَلَوْ كَانَ مِنْ عِنْدِ غَيْرِ اللَّهِ لَوَجَدُوا فِيهِ اخْتِلَافًا كَثِيرًا ۝۸۲﴾ ﴿وَإِذَا جَاءَهُمْ أَمْرٌ مِنَ الْأَمْنِ أَوِ الْخَوْفِ أَذَاعُوا بِهِ وَلَوْ رَدُّوهُ إِلَى الرَّسُولِ وَإِلَى أُولَى الْأَمْرِ مِنْهُمْ لَعَلِمَهُ الَّذِينَ يَسْتَنْبِطُونَهُ مِنْهُمْ وَلَوْلَا فَضْلُ اللَّهِ عَلَيْكُمْ وَرَحْمَتُهُ لَاتَّبَعْتُمُ الشَّيْطَانَ إِلَّا قَلِيلًا ۝۸۳﴾ (النساء)

«Then do they not reflect upon the Qur`an? If it had been from [any] other than Allah, they would have found within it much contradiction (82) And when there comes to them information about [public] security or fear, they spread it around. But if they had referred it back to the Messenger or to those of authority among them, then the ones who [can] draw correct conclusions from it would have known about it. And if not for the favor of Allah upon you and His mercy, you would have followed Satan, except for a few (83) (An-Nisaa).

The relations between the Mu`minin and the earth are generally the same as those we mentioned in the Tawhidi social system, namely “vicegerency”; “exploitation” “reformation” and “enabling”, then there is the relation of “taking warning” from the signs of Allah (SWT) on earth. There is also the relation of “life” and “death” of people, exclusively on earth:

﴿قَالَ فِيهَا تَحْيَوْنَ وَفِيهَا تَمُوتُونَ وَمِنْهَا تُخْرَجُونَ ۝۲۵﴾ (الأعراف)

«He said, “Therein you will live, and therein you will die, and from it you will be brought forth.” (25)» (Al-A`raf)

However, the fact that in this hybrid social system real-world Mu`minin are not equal in the depth of their *Iman*, together with the fact that they are interacting with nonbelievers, may bring them into a new relationship with earth, e.g., “corruption”. As for the relationship between earth and nonbelievers .“it is mainly of “exploitation” and ‘corruption

There are two types of relationship between Mu`minin and the skies, one is that of “enabling-تسخير” and the other is that of “taking heed-اعتبار”:

﴿وَسَخَّرَ لَكُمْ مَا فِي السَّمَاوَاتِ وَمَا فِي الْأَرْضِ جَمِيعًا مِنْهُ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يَعْقِلُونَ ۝۱۳﴾ (الجاثية)

«And He has subjected to you whatever is in the heavens and whatever is on the earth - all from Him. Indeed in that are signs for a people who give thought (13)» (Al-Jathiya);

﴿إِنَّ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ وَالْفُلْكِ الَّتِي تَجْرِي فِي الْبَحْرِ بِمَا يَنْفَعُ النَّاسَ وَمَا أَنْزَلَ اللَّهُ مِنَ السَّمَاءِ مِنْ مَاءٍ فَأَخْبَا بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِنْ كُلِّ دَابَّةٍ وَتَصْرِيفِ الرِّيَّاحِ وَالسَّحَابِ الْمُسَخَّرِ بَيْنَ السَّمَاءِ وَالْأَرْضِ لآيَاتٍ لِقَوْمٍ يَعْقِلُونَ ۝١٦٤﴾ (البقرة)

«Indeed, in the creation of the heavens and earth, and the alternation of the night and the day, and the [great] ships which sail through the sea with that which benefits people, and what Allah has sent down from the heavens of rain, giving life thereby to the earth after its lifelessness and dispersing therein every [kind of] moving creature, and [His] directing of the winds and the clouds controlled between the heaven and the earth are signs for a people who use reason (164)» (Al-Baqara);

﴿وَكَايُنُ مِنْ آيَةٍ فِي السَّمَاوَاتِ وَالْأَرْضِ يَمُرُونَ عَلَيْهَا وَهُمْ عَنْهَا مُعْرِضُونَ ۝١٠٥﴾ (يوسف)

«And how many a sign within the heavens and earth do they pass over while they, therefrom, are turning away (105)» (Yusuf).

The main bonding relations between nonbelievers and the skies are those of “exploitation” and “corruption”. However, in this hybrid social system there may be those actors who have a relationship of “worship” with some entities in the skies, e.g., “sun”; “moon”:

﴿وَمِنْ آيَاتِهِ اللَّيْلُ وَالنَّهَارُ وَالشَّمْسُ وَالْقَمَرُ لَا تَسْجُدُوا لِلشَّمْسِ وَلَا لِلْقَمَرِ وَاسْجُدُوا لِلَّهِ الَّذِي خَلَقَهُنَّ إِن كُنتُمْ إِيَّاهُ تَعْبُدُونَ ۝٣٧﴾ (فصلت)

«And of His signs are the night and day and the sun and moon. Do not prostrate to the sun or to the moon, but prostrate to Allah, who created them, if it should be Him that you worship (37)» (Ha-Mim).

The bonding relations between the actors of the hybrid social system and the components of the invisible world (Angels, Jinn, Satan) is a complex one because we are now dealing, not only with the Satan of the Jinn but also with human Satan, with the latter conspiring with the former against humans in the system, thus generating extremely potent mechanisms to disrupt individual and social life. I do not intend to delve into these complex issues here, but it

«-suffices to mention one of their most potent mechanisms, that of “whispering and sussuration” in the chests of humans as the Holy Qur`an warns the believers

﴿وَكَذَلِكَ جَعَلْنَا لِكُلِّ نَبِيٍّ عَدُوًّا شَيَاطِينَ الْإِنْسِ وَالْجِنِّ يُوحِي بَعْضُهُمْ إِلَى بَعْضٍ زُخْرَفَ الْقَوْلِ غُرُورًا وَلَوْ شَاءَ رَبُّكَ مَا فَعَلُوهُ قَدْ زُهِمَ وَمَا يُفْتَرُونَ ۝۱۱۲﴾ (الأنعام)

And thus, We have made for every prophet an enemy - devils from mankind and jinn, inspiring to one another decorative speech in delusion. But if your Lord had willed, they would not have done it, so leave them and that which they invent (112)» (Al-An'am).

﴿فَلْ أَعُوذُ بِرَبِّ النَّاسِ ۝۱﴾ ﴿مَلِكِ النَّاسِ ۝۲﴾ ﴿إِلَهِ النَّاسِ ۝۳﴾ ﴿مِن شَرِّ الْوَسْوَاسِ الْخَنَّاسِ ۝۴﴾ ﴿الَّذِي يُوسَسُ فِي صُدُورِ النَّاسِ ۝۵﴾ ﴿مِنَ الْجِنَّةِ وَالنَّاسِ ۝۶﴾ (الناس)

«Say, «I seek refuge in the Lord of mankind (1) The Sovereign of mankind (2) The God of mankind (3) From the evil of the retreating whisperer (4) Who whispers [evil] into the breasts of mankind (5) From among the jinn and mankind.” (6)» (Al-Nas).

The relations between Allah (SWT) and the actors of the hybrid social system are even more complex than that between them and Angels, Jinn and Satan, but the reader can have an idea about this complex relationship by imagining all the relations between Allah (SWT) and humans mentioned in the other social systems brought to bear in this hybrid social system.

A question which deserves to be asked here and to be dealt with separately is this: given the concepts of *attractor; self-organization; synergy* and the *common good*, introduced earlier in chapter 5 and in this chapter, can the real-world hybrid social system have an attractor in which it achieves self-organization via unique configurations of social relations and produces the commons for the system? The challenge arises from the fact that the commons for the secular component of the hybrid social system are not the same as those for the Tawhidi component. We have shown that the singular common for the secular agents of the system is worldly pleasure derived from wealth and children while the singular common for the Mu`minin of the system is Iman in Allah (SWT). We also know from systems theory that unless any system, natural or social, is capable of generating synergy such that all its elements can benefit in a win-win outcome the system will not achieve self-organization and will remain unstable. This is because the elements which are excluded

from the synergistic benefits will lose interest in maintaining the system, and will work towards changing, or even dismantling it. Hence, the challenge faced by the hybrid real-world social system is to reconcile the seemingly opposed commons of its two main component agents such that a win-win outcome could be achieved instead of the usual win-lose debilitating real-world experiences. The problem resides in the psychological model attributed by QWV to the secular human agent, which we take as a presupposition. It is a model that generates exclusion when applied to real-life social situations in contradistinction to the psychological model of the Tawhidi human agent which generates inclusion in real-life social situations. Yet our social theory derived from QWV points the way to a solution of a win-win outcome based on the preservation of the five universals (Iman, Self, Wealth, Children, Knowledge). The theory allows for the lawful enjoyment of worldly pleasures by both the secular and Tawhidi agents of the system while at the same time allowing for the preservation of the singular common (Iman) of the latter.

I conclude this section on the structure of the hybrid social system by emphasizing the epistemological lesson that all the complex internal relations between the human components of the system, and between them and the components of their environments in the visible and invisible worlds, and between all of that and Allah (SWT) are the web through which the various *bottom-up* and *top-down* mechanisms work to generate the mundane social actions and interactions and their consequences in the form of real-world social systems and social and natural events. Any scientific explanation which does not take full account of these vertical and horizontal complex relations and mechanisms into consideration will be deficient as the example of the "*phenomenon of Saba*" shows. It is a huge challenge but it has to be faced and Islamic scholarship grounded in the Qur`anic worldview is well suited to tackle it.

6.4 - How Does the Hybrid Social System Work- its mechanisms

The social mechanisms that work in the context of the internal relations of the *Mu`minin*, who represent one component in the hybrid social system, can be, for simplification, looked at from two perspectives, the first is that between believers as brothers enjoining good and forbidding bad in their relations, the second is that between them and the other groups of actors composing

the social system. The study of such mechanisms depends on the scenario of the hybrid social system the researcher assumes. This is true also with respect to the mechanisms that work in the context of the other groups of the hybrid social system.

Since any study of the working mechanisms within the hybrid social system, whether internally through its endostructure, or externally through its exostructure, depends on the scenario undertaken by the researcher there is no point in going into details. It suffices here to say that the same framework of mechanistic analysis applied above to other social systems should be applied with respect to the hybrid social system; i.e., components; environment, structure and mechanisms (CESM). Systemic analysis should also be extended to the relationship between its subsystems: biosocial; economic; knowledge, political; cultural.

تم بحمد الله

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This book - Systems Approach to the Integration of Knowledge: An Islamic Perspective - is an attempt to situate the Islamic perspective on integration of knowledge, a research program initiated by the International Institute of Islamic Thought, within the more general approach to integration of knowledge advanced by the systems paradigm, globally recognized as the frontier of scientific knowledge. Nine reasons for this intellectual endeavor were given and the end result is a unique blend of background literature that spans systems ontology, epistemology and methodology and a robust systemic Qur'anic worldview out of which theories about the emergence and functioning of micro human and macro social systems were crafted. Integration has been shown to be a characteristic of social knowledge derived from Islamic sources.

The integrative turn in Western academia was shown to be a consequence of the response to what is called the meta-crisis of the 21st century. The latter represents "deep and complexly interrelated global crises: ecological, economic, political, moral, and existential, to name but some of pertinence. These complex problems or crises present extraordinary dangers and pitfalls, as well as great opportunities and potentials. Due to their profound interdependencies and feedback loops, these complex and intractable crises can best be understood as a singular socioecological crisis...Indeed, the meta-crisis is a complex, multifaceted totality which is far more complex than can adequately be addressed by piecemeal, monodisciplinary approaches and methodologically restricted research programs. Such approaches fail to account for all its facets and their dynamic, non-linear interrelationships and are therefore incapable of providing adequate holistic accounts of the meta-crisis"

The Islamic perspective on the systems approach to the integration of knowledge had been developed with the call for a post-materialist science in mind. This development was accomplished through three stages: a systemic Qur'anic worldview; the emergence of man; and the emergence of macro social systems. The emphasis was on the integration of social knowledge.



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