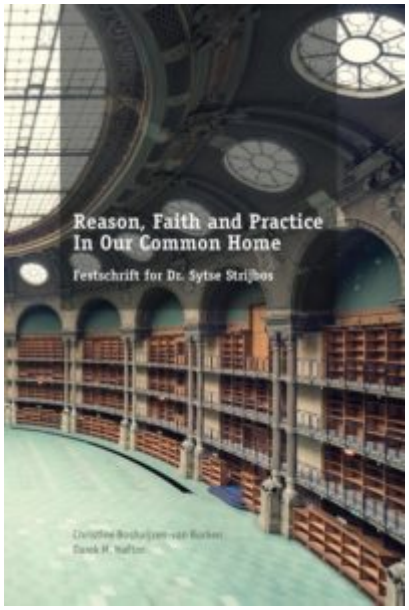
A Dooyeweerdian Critique of Systems Thinking ~ Festschrift for Dr. Sytse Strijbos



Abstract

Systems thinking has developed over the decades, into several streams, which seem to operate in parallel with little dialogue between them. Each stresses different theoretical issues or problems but, in addressing them, other deeper problems are revealed that are often ignored. This essay briefly reviews three of the streams with the theoretical issues they tackle, and some of the deeper problems. To address these deeper problems, and also to facilitate dialogue between the streams, Dooyeweerd's philosophy is employed to reintepret the theoretical issues in new ways, in which meaning is central. This initial proposal calls for further research.

Introduction

In its various forms, systems theory has been employed as a framework for understanding many issues, most related to the relationship between entities and environment. Systems thinking has developed over the decades, into several streams, each of which stresses different theoretical issues: holism, the system, its parts and its environment, and societal systems. As such, each stream throws up new problems, some of which are ignored, ("elephants in the room"). (The use of the word 'system' as in 'systematic' is not considered here.)

Sytse Strijbos (2010) sought to bring together systems thinking with Dooyeweerdian thinking, especially discussing how systems thinking may be interdisciplinary and bringing in a concern with normativity that most systems thought lacks. However, there has been no systematic consideration of how Dooyeweerdian thinking can dialogue with systems thinking in each of its forms.

This article explores the contribution that Dooyeweerd's (1955) ideas can make more generally to addressing such problems, including his law-oriented view of

subject and object, his idea of irreducibly distinct aspects, and his presupposition that meaningfulness, rather than existence, is the foundation. First, issues that are important in several systems discourses are identified, along with problems. Then these are discussed in the light of Dooyeweerdian thought.

Systems Thinking in its Varied Forms

For convenience of discussion, systems thinking is separated into three streams, which stress different major issues, and each of which contains several discourses. The discourses overlap and some discuss issues from other streams. A number of critical questions or problems will be raised as the discussion proceeds.

2.1 Systems Thinking and Holism

Systems thinking is seen by many as an antidote to reductionism, as an holistic approach that tries to be sensitive of the wider world, and not just focus narrowly on entities. Reductions are of many kinds, but the kind that is problematic concerns how we see the world, and reductionism is an adherence (explicitly or tacitly) to a limited way of understanding the world, such as from physicalist, functionalist or managerialist perspectives. To Midgley (2000, 39) reductionism sees the world as "simple, objective, causal", but this does not adequately express all that systems thinking embraces, which can include the non-causal and subjective. Yet some reductionism does not assume causality, so Clouser's (2005) approach is preferred here, which defines reductionism in terms of elevating an aspect of reality, with the result that 'nothing but' that aspect is important in practice, and required for full explanations of all other phenomena.

Systems thinking opposes two tendencies of reductionism: (a) to assume that a whole can be fully explained in terms of its parts, and (b) that the whole may be understood without reference to its environment. Thus systems thinking stresses the *whole* rather than the collection of parts that comprise it: the whole is more than the sum of its parts. A system is more than the sum of its subsystems.

The idea of holism is attributed originally to Smuts (1927), who thought that seeing the universe in terms of 'wholes' rather than in terms of, for example, matter or spirit. It is wholes, rather than parts, which provide the better account. Smuts discussed the structure, dynamism and causality of wholes, and identified a provisional suite of 'gradings' of holism (material, body, animal, personality, groups, spirituality). However, Smuts and others tend to presuppose the

possibility of wholes: what is it that makes wholeness and holism possible?

Systems thinking holism addresses not only the whole-and-its-parts but also the whole-within-environment (von Bertalaffy 1968; Ackoff 1963). Systems thinking takes account of how a system interacts with its *environment* while maintaining its own identity within that environment.

Two major applications of this idea are in the life sciences (organisms in biological, physical and psychical environment) and the organizational sciences (organizations in social, economic, legal and other environments). The question remains, however, on what basis we may differentiate types of wholes and types of environments. Bunge (1979), for example, excluded the possibility of psychical systems "for fear" that some might posit disemboded spirits as systems; fear does not seem valid as a basis for deciding which types there might be.

What diffrentiates system from environment, especially in the organizational field? In the practical context of wanting an holistic *systemic intervention*, Midgley (2000) discusses the idea of *boundary* between system and environment in some depth. It is the concerns of a stakeholder group that defines the boundary that is assumed by that group for a system. From this arises an ethic (values, purpose in action and its associated rituals), which might conflict with other ethics. One group might be 'sacred' (dominant or central), with the other treated as 'profane' (disparaged, marginalized or ignored). Midgley, however, discusses only the *processes* surrounding the operation of boundaries and presupposes differences in concern and stakeholder group. He gives little attention to grounds on which it might be valid to differentiate these. He seems to allow for multiple boundaries (e.g. geographic, social, economic, legal, religious) but does not explicitly discuss this, yet to be able to handle these is vital for discussing human activity systems.

Checkland (1981) introduced what became known as *Soft Systems Thinking* (SST) as a way to address issues in *human activity systems* like organizations and businesses, and groups within them. This recognises that what is a 'system' depends on the way people see it, especially on their *Weltanschauung* (way of seeing the world). Checkland and his colleagues developed extensive practical tools for systems thinking in organizational contexts, including *Soft Systems Methodology*. For example, six main things need to be understood about any human activity system: CATWOE, its customer, actor, transformation,

Weltanschauung, owner and environment.

Yet SST has been criticised by *critical systems* scholars on two accounts. Firstly, SST has no explicit place for normativity, except that which is completely at the mercy of the particpants' *Weltanschauungen*, and hence SST's holism is still constrained by the *Weltanschauungen* of those present. Secondly, SST has little place for societal structures, such as power or ideology, which 'make' people do what they do. Midgeley's (2000) systemic intervention does take structures into account, and even a system's effect on structures in the environment, but still has few firm grounds for normativity.

2.2 Systems Thinking: The System and Its Parts

Systems thinking must have an idea of what a system is. A number of basic propositions are widely agreed, though sometimes a little fuzzily, such as: a system is composed of *parts* that are *related* to each other inside a *boundary* that defines the system as a *whole*. Each part or sub-system may itself be seen as a system, and vice versa: any system may be seen as a sub-system of its environment; this places great emphasis on the *part-whole relationship*. System activity is seen in terms of systems receiving inputs and transforming them into outputs – but is this sufficient? Ackoff & Emery (1972) and many others hold that systems have *purpose;* what constitutes purpose?

Many kinds of entity have been considered systems: manufactured artefacts like bicycles, organizations, physical things like galaxies, living things, and even society itself (Ackoff 1974). This led some to ask how different types of system relate to each other, and Bunge (1979) dfferentiated five levels of systems (physical, chemical, biological, social, technical) and Boulding (1956), nine levels of systemness – static, simple-dynamic, cybernetic (control mechanisms), open or self-manufacturing, societal (plants), mobile and self-aware (animal), self-conscious (human individual), socially-self-conscious (human society), transcendental (ultimate, absolute, inescapable). But on what basis should we judge, or choose between, such suites of levels?

Hierarchy theory (Pattee, 1973) tries to identify principles of such levels, such as: the relationship between levels is asymmetric, entities at each level have properties that characterize that level, an entity may belong to several levels, levels of observation differ from levels of organization, each level imposes different kinds of constraint, and so on. But philosophy would ask what makes

levels, and differences between levels, possible?

Systems are *dynamic* and yet exhibit a certain *stability*. Systems are complex and Ashby (1956) devised his *Law of Requisite Variety*, which states that for a system to be stable, then it needs an internal control system that has at least as many states as the system being controlled. This may be extended to say that a knowing-system (e.g. human or knowledge base) can only understand systems that are simpler than itself.

In living systems, Maturana and Varela (1980) employed the idea of *autopoiesis* as a way to account for how biotic organisms maintain distinctness from the environment while depending on it physically and continously interchanging material with it – as *open systems*. Midgley makes two criticisms of autopoiesis. One is that the plurality of kinds of phenomena are reduced to the biological. How can we understand the stability and integrity of a system without such reducton?

A partial answer may be given by Beer's (1984) *Viable Systems Model*, which was devised in organizational science, it identifies what subsystems a system (of organizational kind) needs to have in order to maintain viability. However, does this model reduce everything to the organizational aspect?

Midgley's second criticism is that Maturana's claim that autopoiesis is 'scientific' boils down to what happens to be meaningful to a consensual community. Given that the community in which the 'theory' of autopoiesis is discussed already accepts pluralism as a starting point, does it do any more than reinforce existing beliefs of that community?

We may also add the questions, What constitutes stability, viability or integrity of the system? Which of many environmental instabilities do we take into account, ranging from random atomic trajectories to the vicissitudes of fashion or markets? If stability is defined in terms of the persistence of the system over time, we must first define what it is meaningful to take into account in judging persistence.

A living system seems also to be a physical system. So some began asking how this could be. Driven by adherence to ideas of evolution, many asked how living systems could evolve or emerge from physical systems. *Emergence* is offered as an explanation: 'higher'-level properties (or 'patterns' or 'regularities') like life emerge from 'lower'-level properties meaningful to chemistry and physics. An emergent property is a property of a system that is not a property of any of its

sub-systems (Hartmann 1952). (Midgley (2000) uses ’emergence’ to refer to causal repercussions, e.g. deaths emerge from drink-driving, but that is not the meaning used here.) The idea of emergence has been around since Aristotle, but Goldstein (1999) gives a modern characterization of it as: features not previously observed, coherence over a period of time, ‘wholeness’, a product of dynamic evolutionary processes, perceivable (“ostensive”). However, for every account of emergence so far offered, is not meaning ‘smuggled in’ from a different level in order to recognise the properties that have emerged? For example, we say that life emerges from chemical subsystems, but on what valid basis do we have the idea of life as something important, as opposed to mere ultra-complex-carbon-chemistry?

The questions remain as ‘elephants in the room’, which few recognise and fewer discuss. They presuppose pre-given meaning.

3.3 Systems Thinking and Social Structures

“It’s the system, and I’m caught!” This meaning of ‘system’, as “an organized society or social situation regarded as hampering, stifling or stultifying” (Webster 1975, 2322) cannot be tackled with the concepts developed above. Neither can the idea of, for instance, economic system. ‘System’, here, refers to structures within which we live and which constrain, and perhaps enable, that living. Normativity, insofar as its implication of ‘ought’ constrains us, may be seen as system. (The term, ‘systematic’ would also seem connected with this.)

This was how Weber (1994) and Parsons (1971) used the term ‘system’. System is that set of structures that constrain and guide our activity, and which operate by mechanical rules. These rules guide the activity of people within such systems. They are mechanical rules insofar as they are designed to be obeyed without question and this means, supposedly, that they remove responsibility from the individual and remove meaningfulness and normativity from their activity. In ‘the system’ – whether of an organization, the state or society – life becomes meaningless. Systemic life is contrasted with the lifeworld by Habermas (1987), which is replete with meaning and normativity.

Two questions arise: First, does this view hold true? Paradoxically, the ‘mechanical’ rules that are system embody a presumed normativity, an idea of what is right and wrong. Even if this were not so, Geertsema (1992) argues that the Weberian-Habermasian view does not hold true, pointing out that even those

trapped in supposedly meaningless occupations can still find meaning and satisfaction even in the very midst of their work. The supposed mechanical following of rules only occurs because people tacitly agree do so. Geertsema's observation suggests that meaning and normativity may be inescapable.

Second, how may it be linked with the above ideas about system? Luhmann (1995) sought to link this with the above systems thinking, by developing a theory of *Social systems*. Social systems challenge the above systems thinking, and require new formulations thereof. If X and Y are two people, then, to X, Y is environment while, to Y, X is environment; if a system is always 'within' its environment, how can X be within Y within X? Does this suggest that the asymmetric idea of 'within' is inappropriate? As Luhmann pointed out not only are individuals within society but society is within individuals. Without resorting to such spatial metaphors, can we understand what kind of relationship this is?

Luhmann tries to account for this by saying that, within a highly complex environment, within the system boundary is a zone of a zone of reduced complexity, which is selected and processed by referring to *meaning*; it is also meaning that defines the distinctive identity of a system; this applies to both social and psychical systems, with different kinds of meaning. To Luhmann, social systems are systems of communication (of meanings). He suggests that the asymmetry of the part-whole relationship can be overcome by communication, which externalizes meaning from the individual by signification.

The idea of part-whole is inappropriate to explain the role that humans play in the operation of a social system. Traditional systems thinking might see the individual human being as part of a group, which is part of an organization, which is part of a subsystem like the economy, which is part of society. And yet the part-whole relationship is no longer adequate. Also, the relationship between the economic system or the education system with each other and with society differs from part-whole.

Luhmann and Parsons both discuss social systems within society, but while Luhmann considers society to be a nondescript environment, Parsons discusses how certain subsystems contribute to the functioning of society as a whole.

To Luhmann, human beings are not part of any system, nor even part of any conversation so that, curiously, not only is society the environment within which

people operate, but people are the environment within which society operates, so that people can change society as well as society, people. This echoes, rather than solves, the fundamental problem above of social systems, of X within Y within X. Traditional systems thinking does not seem fully capable of addressing this.

Habermas (1987) discusses how system and lifeworld relate to each other. It is tempting to see society as a system: as a whole. Society-as-system has subsystems, e.g. the economy, and these may themselves be seen as systems that transform inputs into outputs.

Both society-as-system and its subsystems maintain themselves but the notion of autopoiesis is not sufficient, because it assumes a biologically-relevant environment. What is their environment? Perhaps the lifeworld. And yet, the relationship between society-as-system and lifeworld is not of the usual systemic kind, in that system rationalizes the lifeworld to become its subsystems, which is destructive of lifeworld.

There are other problems. Systematization of society leads to loss of meaning – and hence society-as-system lacks purpose. Habermas recognises that religion has previously accorded meaning, but with the supposed demise of religion, tries to find some other account. Habermas, however, ends up near a reductionism, of all human social activity to communication.

If we are to find insights about systems thinking from considering society as system then many of its cherished ideas must be modified, perhaps radically. But it is not yet clear how the two streams can be harmonized.

2.4 Overview

This shows the huge variety of thought in systems thinking. How may we understand it all? Many questions have been raised in discussing the streams of systems thinking, some of which are ‘elephants in the room’ – problems that have yet to be recognised and then addressed. Whereas systems theorists might try to resolve each problem piecemeal, it might be more interesting and beneficial if we can find a foundational approach which addresses most of them together.

On what fundamental basis is it valid to hold that the various characteristics of systemness are all important — wholeness, part-whole relationships, purpose, environment, emergence, self-regulation, transformations? On what fundamental basis might it be proper to bring the two meanings of ‘system’ together, as their

etymology would suggest should be possible?

Soft systems thinking seems to provide a partial answer to this question, in human subjectivity: it is human subjectivity that decides what is a system and where its boundaries are. However, this is not entirely satisfactory, in that it does not give any substantial meaning to systemness; it is merely one of those myriad of things that emerge from human subjectivity, and there is no answer to what dfferentiates systemness from, for example, beauty or preferences. And, as we have already seen, SST is not good at accounting for structures.

Dooyeweerdian Thought

If we ask that question, we find that most systems thinking discourses make the presupposition, rooted in Greek thought, that Being is the most fundamental state and that systems are primarily Beings. Dooyeweerd argued that this presupposition is fundamentally detrimental to philosophy and the various disciplines and that instead, it is better to conceive of Being as rooted in Meaning. "*Meaning*" wrote Dooyeweerd (1955,I,p.4), "is the *being* of all that has been *created* and the nature even of our selfhood."

3.1 Meaningfulness As Starting-Point

It is meaning, or as I shall call it here, *meaningfulness*, which makes systemness possible, and it is from an understanding of meaningfulness that we can understand and situate, and even integrate, most of the discourses of systems thinking.

Though meaningfulness refers to a Divine Origin of Meaning (Dooyeweerd 1955,I, 4), this meaningfulness is not 'imposed' directly by a Deity, but rather is a gift from the Creator to enable Creation to function with dignity.

Meaningfulness is something we and all things 'dwell within', rather than a property of things (Polanyi & Prosch 1975). "We have been fitted into this coherence of meaning with all our modal functions" (Dooyeweerd 1955,i, 4). A useful metaphor might be than of an ocean, in which fish swim and corals exist, but which also is the very thing that enables fish to swim and corals to exist. So meaningfulness is an 'ocean' within which all reality 'swims' and 'exists' or dwells, and which enables reality to 'swim' and exist. It is similar to Heidegger's insight that being is a dwelling within a world comprised of other beings, but here the dwelling is within meaningfulness rather than just among other beings that

constitute the environment, and it is meaningfulness that enables both the system and its environment to exist and occur.

This meaningfulness is diverse, and Dooyeweerd delineated fifteen distinct ways of being meaningful, which he called aspects or spheres (quantitative, spatial, kinematic, physical, organic, psychic, analytic, formative, lingual, social, economic, aesthetic, juridical, ethical, pistic). As Basden (2008) explains in its Chapter III, all being, functioning, normativity, possibility, rationality, relationships, etc. can derive from meaningfulness and in diverse ways and of diverse kinds. Each provides norms that lead to overall good; for example the economic aspect directs us towards frugality, and the juridical aspect towards justice.

Each aspect is innately linked with others, by relationships of dependence (e.g. social functioning depends on lingual), and analogy, by which each aspect contains echoes of all the others (e.g. the ideas of growth of an organization or economic growth are meaningful by analogy with the organic aspect but are not governed by its laws). Beware of analogy; it is subtle and may lead astray, as can be seen in the economic area.

3.2 Reinterpretation of Systems Concepts

This can help provide a new foundation for understanding systems. What follows are brief discussions of how each of the characteristics and problems of systems thinking may be reinterpreted (affirmed, critiqued and enriched) by Dooyeweerdian thinking, and how the main streams of systems thinking may be brought together.

System within Environment.

All systems exist and function within an environment, but this has two, not one, sides. Not only is there the fact-side of the system and all co-existing things with which it interacts, but there is also a law-side, which is the ocean of meaningfulness within which both system and its environment 'dwell' and enable them to be system and environment. From the perspective of meaning, there is no asymmetry between the beings of the system and the world.

Environment and its Diversity.

From the perspective of the law-side, environment is inherently of diverse kinds. We may identify a different environment with each aspect:

– a spatial and kinematic environment that surround the system;
– a physical environment, with which it exchanges physico-chemical materials;
– an organic environment for living things as an ecology of other living organisms;
– a sensory environment for animals, of seeing, hearing, feeling and motor responses;
– an analytic environment for human individuals of distinct concepts and ideas;
– a formative environment for humans, of artefacts and technologies, which individuals shape by formative power;
– a lingual environment, of messages, literature and bodies of recorded knowledge or information;
– a social environment, of relationships, roles and institutions;
– an economic environment, of resources and their production, management and consumption;
– an aesthetic environment, of enjoyment and harmony;
– a juridical environment, of justice and injustice, and their expression in laws and social norms, and the means of maintaining them;
– an ethical environment, the attitudes of self-giving generosity or self-centred competitive defensiveness that pervades society;
– a pistic environment, of prevailing beliefs, presuppositions, aspirations, commitments and views of what is ultimately meaningful in life.

Wholes (Systems as such).
Dooyeweerd's theory of entities provides a sophisticated notion of a whole as a multi-aspectual thing. The being of the whole is its meaningfulness in each aspect. Thus a poem, *qua* poem, must have an aesthetic aspect, also a lingual aspect, and a physical aspect of medium, a formative aspect of structure, and is usually better if it is frugal rather than wasteful in word-use (economic norm). Thus any system-as-whole can be understood an a coherence of multiple spheres of meaningfulness, a different aspectual profile of coherence for each kind of system. That profile, Dooyeweerd called a *structure of individuality*, in that by it we could meaningfully describe each individual of a kind, and it also guides the individuals in their becoming and destiny.

Emergence, at least of the strong kind, may be understood as viewing the whole from the perspective of a later aspect, for example the organic rather than the physical. That is the 'smuggling in' of meaning.

Purpose of a System.

Purpose is to do with meaningfulness. Under Dooyeweerd, the purpose of a system is the aspect that most makes the system meaningful overall, as enabling what is good for the system; for example, biotic for living systems, economic for businesses. The multi- aspectual nature of systems suggests mutiple purposes, but there is one aspect, the *qualifying aspect*, which most clearly defines and guides the destiny of the type and which the functioning in all other aspects serves. There is also a *founding aspect*, which most clearly speaks about its coming-into-being. System purpose, then, is no longer a problematic notion.

System boundary.
It is this profile that offers a basis on which to delineate and understand system boundaries. Just as there may be many environments, and each system is multi-aspectual, it would be natural to expect multiple boundaries of a system. Checkland's (1981) fence-painting system is bounded spatially by the extent of the fence, but is bounded socially by the neighbourhood of those who will see and appreciate the fence, and bounded economically for example by the budget set for or by the painter. This can raise and answer the questions that Midgley's (2000) discussion of boundary omitted: how do we understand the concerns, and identify stakeholder groups, from which choices of system boundaries arise. This can then inform his discussion of the processesrelated to boundaries.

Weltanschauungen in Human Activity Systems.
Checkland's notion of *Weltanschauungen*, by which different people hold different views on what is the system, can be understood as a person's view that certain aspects are meaningful while others are less so. Indeed, Checkland explicitly defines the *Weltanschauung* as "that which makes the system meaningful". For example, the finance department of a company would adopt an economically-qualified *Weltanschauung* while the Directors of the company might adopt a pistically-qualified *Weltanschauung* (Mirijamdotter & Bergvall-Kåreborn 2006). In this way, Soft Systems Thinking retains its sensitivity to subjective assignment of value but need no longer be arbitrary. Moreover, since each aspect provides an inherent normativity, Soft Systems Thinking might obtain a normativity that it hitherto lacked (Basden & Wood-Harper 2006). *Disclosive Systems Thinking* (Strijbos 2000) is similar to SST but puts normativity central, recognises its diversity and tries to disclose it. Dooyeweerd's aspects may be employed in such disclosure (Goede et al. 2011).

Relationships between Wholes (Systems).

Wholes function as subject in the various aspects, in subject-subject and/or subject-object relationships. Whether it is a subject or object depends, not on the whole itself, but on how it functions in each aspect, and a system may be both subject and object in different aspects (Basden 2017). Thus, for example, when an animal climbs a rock for vantage (Gibson 1979) the animal functions in the psychical and physical aspects as subject, while the rock functions as subject in the physical aspect, by being rigid and offering friction, but as object in the psychical aspect, by affording climbability. On the other hand, two animals might mate or eat each other, both functioning as subjects in the organic aspect.

Part-whole Relationship.

Dooyeweerd differentiated the part-whole relationship from what he called enkaptic relationships. The relationship between a hermit crab and the shell it has found and made into its home, is one of *subject-object enkapsis*, not part-whole. The relationship between a town and its orchestra or university – and maybe between society and its various Weberian subsystems – is one of *territorial enkapsis*. The relationship between trees, insects, fungi etc. and the forest is one of *correlative enkapsis*, whereby the denizens generate the forest that enables them to exist. The relationship between society and human beings is one of correlative enkapsis, not part-whole. The *part-whole* relationship is that in which the part, *qua* part, has the same qualifying aspect as the whole but, independently of the whole, has an earlier qualifying aspect. Thus a lung is qualified by the biotic aspect only as part of the animal, but, when functioning on a bench, is qualified by the physical aspect of filtering and absorbtion.

Autopoiesis and Self-maintenance.

Autopoiesis is primarily an organic concept, referring to how organisms maintain their organic integrity in an environment with which they exchange physical materials. By analogy, it has been extended to, for example, how organizations maintain themselves as organizations, and society maintains itself. However, the mechanisms by which plants, organizations and society maintain themselves differ and must take into account the different qualifying aspects of each. Autopoiesis and self-maintenance are usually discussed and studied by reference to their *processes*, but Dooyeweerd would suggest that we focus on their *meaningfulness*, because this is what defines most clearly what is to be maintained. For example, in a plant, the self-maintenance is deemed successful as long as it stays alive (organic aspect), while to a business, self-maintenance is deemed successful by

reference to its economic aspect (usually encoded into company law as conditions for going into insolvency). This suggests that any general theory of self-maintenance is incomplete without explicit reference to the qualifying aspect of the system concerned, and probably other aspects of its structure of individuality.

Social Systems.

In social systems, each system is also part of the environment of other systems, which can be a problematic idea. Instead of trying to define system-environment relationships, Dooyeweerd would suggest thinking about how both systems are enabled in their very existence and functioning by the 'ocean of meaningfulness' within which both operate and which enables both to exist and function. Luhmann's conundrum that people are within society but society within people, is also resolved as follows: "society within people" refers to people functioning in the aspects that make "society" meaningful, especially the juridical, ethical and pistic, while "people within society" refers to correlative enkapsis in certain aspects as outlined above.

Society as System.

Society is not an entity in the sense discussed above, of being defined by a structure of individality. Instead it, like a forest, is an *Umwelt*, which exists by virtue of *correlative enkapsis*, as a co-generative interplay between itself it its denizens. Though a forest functions primarily in the quantitative to psychic aspect, because those are the aspects in which its denizens function as subject, society functions in all aspects, because in all aspects human individuals function as subject and its functioning in each aspect is a subsystem thereof: its economy (economic aspect), education (lingual), judiciary (juridical), etc. In the ethical aspect, the 'subsystem' may be society's pervading attitude and in the pistic, its prevailing beliefs and presuppositions. Society may even be said to function in the physical and organic aspects if we take such issues as climate change and deforestation into account as societal phenomena. The supposed subsystems of society- as-system, such as the economic and educational systems, are not related by part-whole, but by territorial enkapsis. The self-maintenance of society is no longer by some subsystem of a viable system model, but by the functioning of its denizens in correlative enkapsis.

System and Loss of Meaning.

Habermas (1986; 1987) argued that system implies loss of meaning because it operates by mechanical rules. But this is unhelpful on two accounts: there is no

necessary complete loss of meaning, and loss of meaning occurs by something other than rationalization. 1. This might be the case if all meaningfulness is only generated *ex nihilo* by attribution and signification of people, but if meaningfulness is an ocean within which all operate, then even the mechanical rules exhibit meaningfulness. At the least, as Geertsema (1992) points out, there is formative meaningfulness in the rules and there is probably some juridical meaningfulness in that many rules 'make sense' in terms of justice, as well as economic meaningfulness in how resources are used, and aesthetic meaningfulness in that many rules are about maintaining harmonization. The problem of mechanicality of the rules is no longer to be seen as loss of meaning, but rather as an undue elevation of one aspect of meaningfulness, usually the formative aspect of achieving things or the economic aspect of efficiency. 2. Loss of meaning arises from other aspects being omitted or ignored. Since meaning always involves referring beyond (Dooyeweerd 1955,I, 4,110), nothing and no aspect can exhibit meaning in itself, when isolated from the others and from the central totality. When aspect or an entity is absolutized this occurs, and complete loss of meaning results.

System and Lifeworld.
Under Habermas, lifeworld forms an 'environment 'for mechanical system, but not in the usual systems sense. Under Dooyeweerd, lifeworld is the stock of background knowledge about everyday life. Everyday living is a functioning in all aspects without any one dominating. Lifeworld is thus inherently multi-aspectual, in which no single aspect has any prior claim to dominance. It is thereby replete with the rich meaningfulness and the normativity afforded by each and every aspect.

Humanly-generated rules express the normativity of one or few aspects. System, as set of rules, is thus seen as focused on a single aspect (or few). Rationalization of the lifeworld is an attempt to apply the analytic aspect to it, to pick it apart and maybe reconstitute it, and as such it falls away into nothingness, not because it is fragile, but because this is inherent to this kind of functioning, which Dooyeweerd calls the *Gegenstand* (Basden 2011). Differentiation of society Separating out distinct ways in which society might function and institutionalizing those ways, which does indeed involve the analytic aspect, is not necessarily a bad thing. Dooyeweerd discussed this at length, for example clearly differentiating society from the state, and this from the business, from the religious instution, from the

family, etc. Each sphere of society is governed by a different aspect, and brings its own meaningfulness. Dooyeweerd argued that differentiation is inevitable if we are to disclose and open up the potential of the various aspects, for example opening up the lingual aspect with writing, drawing, printing, broadcasting and now ICT and the Internet. The problems that we experience with differentiated societal spheres lie not in differentiation as such but in the absolutization of various spheres (e.g. the economy) and the demand that other spheres serve it, and in the lack of attention to the inter-aspect coherence.

Conclusion

This essay has briefly reviewed three streams of systems thinking to reveal some of its deeper challenges. It has then outlined how it is possible to reinterpret many of the concepts of systems thinking from Dooyeweerd's perspective, in a way that retains the importance and thrust of each. No longer is 'system' taken for granted, but what systemness is has been exposed as rooted in meaningfulness. By moving them from their adherence to an existence presupposition, to a meaningfulness-oriented presupposition, each concept has been placed on a new foundation, has been replanted in fresh soil. The soil is in many ways more fertile, and so many of the concepts have been enriched.

This opens up new avenues for research and discourse in systems thinking. The problems identified in Section 2 might be addressed if the Dooyeweerdian approach were to be developed, and the various streams of systems thinking have been painted into a single picture.

This paper is only a start. It is all too brief in both its overview of systems thinking and which concepts are meaningful therein, and its suggestions for a Dooyeweerdian reinterpretation are only sketchy. Both are in need of further development.

References

Ackoff, RL. (1963). General Systems Theory and systems research: contrasting conceptions of systems science. *General Systems*, 8: 117-24.

Ackoff, RL, Emery, FE. (1972). *Purposeful Systems*. Adline-Atherton, Chicago, USA.

Ackoff, RL. (1974). *Redesigning the Future: A Systems Approach to Societal Problems*.

Ashby, WR. (1956). An Introduction to Cybernetics. Chapman & Hall.

Beer S. 1984. The Viable System Model: its provenance, development, methodology and pathology. *J. of the Operational Research Society*, 35, 7-25.
Boulding KE. (1956). General systems theory: the skeleton of science. *Management Science*, 2(3), 197-208.
Bunge, M. (1979). *Treatise on Basic Philosophy, Vol. 4: Ontology 2: A World of Systems*, Reidal, Boston.
Checkland, P. (1981). *Systems Thinking, Systems Practice*. Wiley.
Dooyeweerd, H. (1955). *A New Critique of Theoretical Thought*, Vol. I-IV, Paideia Press (1975 edition), Jordan Station, Ontario.
Geertsema, H. (1992). *He Menselijk Karakter van ons Kennen* (The Human Character of our Knowing). Buijten en Schipperheign, The Netherlands.
Goede, R., Basden, A., Ingram, R. (2011). Disclosing disclosive systems thinking: Towards a methodology. pp. 29-40 in *From Technology Transfer to Intercultural Development*, ed. J. van der Stoep & S. Strijbos. Rozenberg Publishers, Amsterdam and AFRICAN SUN MeDIA, Bloemfontein, South Africa
Goldstein, J. (1999). Emergence as a construct: history and issues. *Emergence: A Journal of Complexity Issues in Organization and Management*, 1(1), 49-72.
Habermas, J. (1986). *The Theory of Communicative Action; Volume One: Reason and the Rationalization of Society*, tr. McCarthy T, Polity Press.
Habermas, J. (1987). *The Theory of Communicative Action; Volume Two: The Critique of Functionalist Reason*, tr. McCarthy T, Polity Press.
Hartmann, N. (1952). *The New Ways of Ontology* Chicago University Press.
Luhmann N. 1995. Social Systems. Stanford: Stanford University Press.
Maturana H, Varela, F. (1980). *Autopoiesis and Cognition: The Realization of the Living*. Reidel.
Parsons, T (1971). *The System of Modern Societies*. Englewood Cliff, NJ, USA.
Pattee, H. H. (1973). *Hierarchy theory*. Braziller, New York.
Polanyi, M Prosch, H. (1975). *Meaning*. University of Chicago Press.
Smuts, JC. (1927). *Holism and Evolution*, 2nd edition. Macmillan.
Strijbos, S. (2000). “System methodologies for managing our technological society: towards a ‘Disclosive Systems Thinking'” *J. Applied Systems Studies*, 1(2):159-81.
Strijbos, S. (2010). Systems thinking as interdisciplinarity. In *Systems Thinking and Philosophy as Interdisciplinarity*: Proceedings of the 14th Working Conference of the Centre for Philosophy, Technology and Social Systems, Basden, A., Haftor, D., Grobler, LMJ. (eds.). CPTS, Maarssen, Netherlands. ISBN: 978-90-807718-7-1.

von Bertalanffy L. 1968. *General Systems Theory: Foundations, Development, Applications*. New Yourk: George Braziller.
Weber, M. (1994). *Political Writings*. Cambridge University Press.
Webster. (1975). *Webster's Third New International Dictionary of the English Language, Unabridged*. Encyclopaedia Britannica Inc., Chicago, USA.