PROBLEMS AND PARADIGMS IN HUMAN INTELLECTUAL ENDEAVOUR

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EXTENDED ABSTRACT

Introduction

In order to understand parts of the world in the course of their navigating in it, human beings construct mental or physical 'images' of these parts. These images have been evolving throughout the 'human intellectual endeavour' as their shortcomings or 'problems' had been realised and corrective intellectual action taken usually through 'paradigm changes'. One of these hugely significant images affecting lives and society is 'conventional science of physics'. However, when confronted with 'issues of problem solving' presented by scenarios with more than a single object in relations especially with living, in particular human, components, methods of conventional science have limited applications. On the other hand, the methodology of conventional science is a powerful means for constructing images. These issues are regarded as problematic so the intention of current work is to introduce a paradigm change to a 'new science of systems' which makes use of the methodology of conventional science but with 'systemic' content. This science is offered for debate of acceptability [Korn, 2009, 2012, 2013, 2016]. In particular, the objective of this paper is to discuss a number of concepts arising in this 'new science' and to place it in the historical context of human intellectual endeavour.

Notion of change

The dictionary describes the concept of dynamic verb 'to change' which somewhat modified is : 'To make the form, nature, content of things, present or future course of events, minds, opinions and so on different from what it is or from what it would be if left alone [Anon. 1995].

This description implies the presence of :
An initial state [IS] which is regarded as problematic in some ways otherwise there would not be a change or an alteration,
A final state [FS] which gives direction to and hopefully resolution of the change, and
A mechanism or a 'system' or an 'active structure' which is intended to accomplish the transformation from IS to FS.

The initial and final states must be consistent otherwise a mechanism or process could not exist. Consistency is judged by the kinds of 'properties' carried by the 'empirical objects' involved in a change.

Nature of change

An 'empirical object' is described as one that can be detected by the senses of an observer through perceived 'properties' as opposed to a 'theoretical object' which is expressed by a 'structure of statements of the subject predicate' form [Korn, 2016]. Both kinds involve a degree of 'interpretation' which can cause misunderstandings. Any change of state

involves an ‘empirical object’ physical or mental which carries the change. The senses carry the physical properties seen to be involved in a change to a brain/mind assembly of a living thing which transforms them into ‘thoughts’ for generating, or not, action.

When action is initiated by an observer to be performed by an aggregate of interacting objects, we speak of ‘1st order cybernetics’, when the observer itself takes part in the action we have ‘2nd order cybernetics’ [Umpleby, 2000]. The latter case can occur in ‘purposive systems with feedback’ [Nice, 2008, Korn, 2012, 2016].

Changes take place in parts of the
‘Inanimate, natural world’ due to action by mechanical [volcano, earthquake, tornado…], electrical [lightning…], chemical [burning by lava…] effects arising by chance,
‘Animate, natural world’ including ‘humans’ due to accidents by chance and intentionally according to purpose,
‘Social world of living things’ due to accidents by chance and intentionally according to purpose,
‘Artificial world’ due to accidents by chance and intentionally according to purpose by control and computer systems.

Purposive activity is as common in the living sphere as the phenomenon of gravity in the material sphere. It has been operating since times immemorial and structurally has not altered.

Images of parts of the world

In ancient times people looked around their surrounding including the heavens and attempted to express their thoughts which they communicated, or not, to their fellow human beings perhaps first by means of natural language. Natural language is the immediate symbolism for representation of aspects of parts of the world called the ‘primary model’ and has served as a means for navigating in the world. It can do this due to its structure or syntax of ‘subject – predicate’ which reflects the structure of parts of the world and is considered innate in humans with semantics learnt in the course of growing up [Chomsky, 1965].

Based on natural language a vast variety of other models have been invented : Systems of gods, mysticisms like astrology, superstitions like omens, all requiring an ‘intermediary’ for interpretation of aspects of parts of the world. They eventually were superseded by conventional science of physics which observed a part of the world directly and formulated relations between concepts of selected aspects in terms of mathematical models and formulated explanatory hypotheses sometimes of great generality [Pledge, 1966].

Great achievements of physical constructions like pyramids, aqua ducts, cathedrals, railways etc and a huge variety of artefacts together with intellectual accomplishments in the arts and sciences have been realised by humanity as ‘products’. Remains of these have survived and are in use by people but the ‘systems’ or ‘active structures’ which created them by and large have disappeared. It is astonishing that this huge accomplishment still going on, has taken place practically without a supporting ‘systemic or engineering theory’ [Lewin, 1981].

Although the term ‘system’ has been in use since ancient times like solar system and its use is popular today, there has been scare theoretical development in this field of experience. Attempts have remained at the speculative level resulting in fragmentation of this essentially ‘unique phenomenon’. A large and significant approach hit the intellectual field in the form of ‘control theory, before and during the 2nd WW followed by another initiated by von Bertalanffy and associates in the 1950 which has led to a vast effort of publications, conferences, sporadic teaching and models with ill defined concepts [Bertalanffy, 1950].

Models as stories or description of parts of the world real or imaginary as natural language are immediately comprehensible to those familiar with a language. Other models have been created like mathematical models which are capable of computation, diagrams of large variety which display structure, artistic works and designs and so on. All models require the selection of their own ‘invariants’ like quantifiable concepts of a mathematical model, labelling of a diagram, colours and shapes of a painting which can then be used for creating relations to form the selected ‘model’ of a ‘whole’.

There is a great deal of uncertainty and lack of understanding in selecting invariants called the ‘methodological problem’ which leads to a ‘model’ which is not possible or difficult to ‘read’ or to reproduce its original comprehensible natural language form. If this form is regarded as ‘faithful’ representation of a part of the world then another ‘model’ may be regarded as a distorted form. The ‘methodological problem’ can be solved by using natural language itself for the development of a ‘linguistic model’. ‘General principles’ and linguistic modelling in its operational form is the basis of development of a ‘new systems science’ which constitutes the current paradigm change.

This science if debated and turns out to be acceptable, is intended to be the ‘science of structure of related [in static state] and interacting objects [in dynamic state]’. It is friendly to problem solving and design or engineering [Lewin, 1981], based on accepted branches of knowledge, eminently teachable at all levels and can be used for modelling living and human activity scenarios i.e. it is not sensitive to boundaries of disciplines, can include particular methods of conventional science for working out specific problems associated with single objects, unlike conventional science it can cope with ‘irregular occurrences or behaviour’. Thus, ‘systems and conventional sciences’ together produce the ‘scientific enterprise’. Software development for simulation in time is still needed.

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