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YES, THERE IS A GENERAL SYSTEM PRINCIPLE

NO, IT IS NOT A THEORY

By Tom Mandel

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ABSTRACT

GENERAL SYSTEM ~~THEORY~~ PRINCIPLE

The science of relationships was primarily established by the biologist Ludwig von Bertalanffy in his promotion of the idea of organismic philosophy also known in science as systemics. He does not challenge science as a whole, but proposes new organizational rules which take science to the next level. At one time classical science took elements apart in order to study how it all worked. The science was about parts. Organismic science put elements together in relationships in order to study the resultant relationship as a whole. It appears that everything in the Universe exists as a whole by working together. And now we have a science about that – the science of simple and complex relationships. It is proposed herein that if we broaden the definition of Loving to include all relationships, we can use that general term to describe the universal relationship. And in this sense, "Love makes the world go around."

THE MODERN SYSTEM

The ISSS Primer, charged with the role of defining a system, defines it as a complementary of the general philosophy and the specific Part B. Part A is seen as "a family" of meaningful relationships among the members, acting as a whole…" A whole-system is a family in a meaningful relationship with its environment as a whole

Part A - This and That in a Loving Relationship is Something Else. C = L(A, P)

. a family of meaningful relationships among the members acting as a whole R(A,B) =C

Here are the partial listing of specific elements of systems, our part "B"

Systems, (from the Four Directions of Philosophy, Theory, Methodology and Application), as a family of meaningful relationships among the members acting as a whole and possessing organization as a process with aspects determined by boundaries of information and control as set by the observer according to subjective and objective considerations that might be static or dynamic, with qualities or quantities that are simplicity compared relatively to complexity expressing itself as a closed and/or open system having form and function which can have emergent effects creating an evolution or devolution depending on internal or external relationships utilizing differentiation and integration to form order out of chaoic behavior all at once over a period of time.

Keywords: General System Principle. Universal Operating Principle; Wholism; Organismic; Integrating Relationships

INTRODUCTION

I am re-submitting a paper originally presented at the 1995 ISSS annual meeting titled, “Is There a General System Theory?” later in this paper. A very positive review of that paper by the Editor of the International Encyclopedia od Cybernetics and Systemics is included at the end of that paper.

The abstract reads: ” The subject of a General Systems Principle, a.k.a. General Systems Theory, is at the root of ISSS's work. Yet little has been done at this most general level. Most systemists have accepted Bertalanffy's minimal definition - elements, relations and wholes - going on from there to derive their particular system; for example, as Anderson & Carter (1984) write, "Systems models of various kinds are used in many fields besides sociology, so a social system can be thought of as a special case of a more general system model."(1).

But some others go on to create an entire new general system of their own, which they attain by particularizing the general definition somewhat, in effect creating a "sister" GST. For example, the Principia Cybernetica Project within ISSS itself holds, "...that in our time, the age of information, it is systems science and cybernetics, as the general sciences of organization and communication, that can provide the basis for contemporary philosophy." (ISSS Bulletin, 1994, Winter, pp.52.)

The former derivative process results in the same thing being said but in different ways. The latter inventive process, unfortunately, is populated by many who would modify the general system by introducing "something new." This "invention," often contains incorrect assumptions subsequently leading to errors making it difficult if not impossible to understand and use their systems. ISSS has many such "theories" on record.

Clearly, if in fact there is a General System "out there" our task would be not to "invent" unique conceptual theories, but to describe what we have discovered the best we can. And if in fact there is a general system, it is "necessary" that it can be explained in myriad of ways, yet all will be using the same principle. A General System requires a General Principle. Do we find such a "thing" just about anywhere we look?

Unknown to many, if not most, scientists is a revolutionary paradigm shift from investigation of the single whole to the investigation of an interrelated organismic system of wholes interconnected by mutual relationships. This change in perceptual emphasis from nomenclature to action was mainly brought about by Ludwig von Bertalanffy, a biologist working in Germany and later in Canada.

He writes in his book *General Systems Theory*; “There is this hope, I cannot promise you whether or when it will be realized - that the mechanistic paradigm, with all its implications in science as well as in society and our own private life, will be replaced by an organismic or systems paradigm that will offer new pathways for our presently schizophrenic and self-destructive civilization." (Ludwig von Bertalanffy.) [4]

BACKGROUND

The notion of a General System Theory was formulated in detail by the biologist Ludwig von Bertalanffy long before WWII. He developed this organismic concept after observing similar traits he saw in the bones of various skeletons. Because of the similarities he noticed, he concluded that there is a general system. He authored the book "General Systems Theory" published in 1969. He was part of the group who created an International Society for General Systems Research now known as ISSS or the International Society for the Systems Sciences.

His emphasis did not create a new and different science. Instead he formulated a new perspective of investigation from that of the part to that of parts interrelated as a/the Whole. The change of emphasis is from the noun to the verb.

"Any intelligent fool can make things bigger and more complex. It takes a touch of genius and a lot of courage to move in the opposite direction." (A. Einstein, 1954)

A CHANGE OF VIEW

This paper strives to discuss a radical change of scientific perspectives held by most scientists. Perhaps every scientist and perhaps every other person as well, has wondered how this universe works. Sometimes they listen to ideas formulated by others, sometimes they try to understand on their own. Sometimes they attribute the formation of the Universe as a form of magic. On the other hand, for some, a scientific examination is called for. All of these concepts are the products of thought.

Is there a general system that applies to all there is? Does one suppose nature has progressed this far without a general system? Are we but an accident? Or is there a general plan?

This paper assumes and outlines that general plan.

However, it turns out that the way we name things as a noun is misleading all of us because the true meaning of our universe is what everything is doing – a verb. So the General System is not about a thing, instead it is about what a thing is doing.

Actually the notion of a general system is a very simple idea. A general system would have to explain everything including the simplest. It is the simplest description we can conceive of if only to also explain that simplest. But the simple is not as simple as some suppose. There is a notion called "dualism." They want to say that the Universe is made of this and that, there are two sides to a coin. Yet there is a third side inside the coin that makes it worthwhile. Pun intended.. The essence of this systemology is "Elements working together as a single whole.". And in this sense disqualifies dualism as an explanation.. Yes, there are heads and tails, but there is also a hidden inside that holds them together as one whole. There are three sides to every coin, and that side inside is where we keep the gold.

Recognition of this kind of thinking leads to the conclusion that there are two ways of thinking/conceptualizing. We can think in terms of the object or we can think in terms of what the object is doing. We can save the coin or we can spend it. The primary difference between the two is that the old classical science limited itself primarily to a single element, while the new systemic science includes not only the stuff, but also what the stuff is in a relationship with.

And it is the relationship between them that matters most.

GENERAL SYSTEM PRINCIPLES

I am using the word ”System” because we can grasp the meaning or actions of events as they are working as an integrative system. So it isn't the word “system” that we are talking about. It is only a tool that happens to be very close in definition to what we really are talking about. Some investigators assume it is “their” system they are working with, Then they define system their way. But the kind of system I am talking about here is the integrative system in which the so-called parts form a new kind of system as a whole. The essence of this systemology is “Elements working together as a single whole.” Without adding verifiable additions to this formulation, it can be said that philosophically this expression is universal. It thus qualifies as a philosophical definition of a general system if indeed such a general system exists. .

THE SCIENCE OF RELATIONSHIPS

Jonas Salk, creator of the polio vaccine, writes in his book, “Anatomy of Reality” confirming the existence and role of the relationship. He writes:
; “When I try to imagine how all of this may have started, I envision what I call Pure Energy in a state from which matter could emerge, out of this shimmering web of energy a few specks coalesced in an orderly arrangement. ..Simple rules must exist by which the cosmos is held together, and all these rules are now being explored. It appears to me that the fundamental unifying principle in the cosmos is relationship. This may account for the trend toward increasingly complex relationships in all forms of matter, and even the importance for close and harmonious relationships among human beings…Matter at each level of complexity appears to consist of two interdependent, non identical elements in dynamic interaction and in interacting, dynamic, asymmetrical binary relationship is the fundamental module of order in the cosmos…I see things differently, with more meaning, as I look for the dynamic asymmetrical binary relationship that is reflected in all the phenomena in nature.”

CHOOSING A NEW VIEW

I am using a paper I authored that was accepted for presentation at the 1995 meeting of the International Society for the System Sciences as a reference for this project. In short, the essence of systems science in a mental situation is a change of perspective from the part to the whole. So a typical person can look at and see the parts, and yet another person can also see the wholeness. It seems that many are looking in the wrong direction. Or, it is difficult to see the parts and the Whole at the same time. We need to see both the parts and the wholes. An example of this is the ISSS symbol which can be seen in two different ways one is the single letter “S” and the other way looks like a collection of parts. Interestingly, we see one or the other, but we are unable to see both at the same time. The ISSS symbol can be viewed in one of two ways in a visual study.

THE WRONG DIRECTION

The title of the 1995 paper, “Is There a General System Principle?” is a question I plan to answer here. Amazingly we allow our language of words to tell us there is no general “theory” of how it all works. The language calls for a general “theory”, but any theory necessarily of specifics is not general. So we

created the problem of our general theory by being too selective.

There is, however, a General System "Principle."
The science of integrative systems is a new kind of science and differs from the old traditional science in that instead of knowing a single object, in a minimal sense, a system, involves at least two elements and a relationship all of which together form a new whole. . For example, the elements of cellular skin is composed of two fork shaped molecules back to back repeated over and over.

Ludwig von Bertalanffy wrote about such organismics before and after the world war. In 1966 Bertalanffy and four others organized an international society to study the search for a general system. This new science places the emphasis on the relationship (Interaction) of the elements.

So the emphasis an observer could have is not a recognition of some thing, Instead it is a recognition of what things are doing to each other.

We do not exist as a survival, we exist by working together.

This reformulation of science was hinted at by a few scientists, but it was von Bertalanffy who brought it all together. His initial formulation made the distinction from the old emphasis on a single element by emphasizing a relationship between elements all of which form a new whole. The parts of salt are poisonous, but together they make food taste delicious.

The search for a general system occupied the efforts of many in recent times. But it appears that each author has particularized it. And by doing that, the generality is lost/hidden. For example, we can say the $a^2+b^{(2}=c^2$ and say that is general for right triangles. But if we plug in specific terms then we have $3^2+4^2=5^2$ and that applies only in this specific case. Perhaps the closest we can come with systemic generality is as Bertalanffy points out – "a system is elements in a relationship emerging as a whole."

There are many researchers of systems theory. Systems theory is not a set of particular theories, it instead is applied across the board. One might study the interactions in a literal novel, or create them. And then many researchers study the interactions occuring in the brain, and, of course, human relations. Interestingly, it seems the language of human families appear to systemic in nature. We can recognize a person named "Bill" but it is the systems word "father", a relationship, that tells us so much more.

But as Bertalanffy puts it,

"Our civilization seems to be suffering a second curse of Babel: Just as the human race builds a tower of knowledge that reaches to the heavens, we are stricken by a malady in which we find ourselves attempting to communicate with each other in countless tongues of scientific specialization... The only goal of science appeared to be analytical, i.e., the splitting up of reality into ever smaller units and the isolation of individual causal trains...We may state as characteristic of modern science that this scheme of isolable units acting in one-way causality has proven to be insufficient. Hence the appearance, in all fields of science, of notions like wholeness, holistic, organismic, gestalt, etc., which all signify that, in the last resort, we must think in terms of systems of elements in mutual interaction...(Bertalanffy 1969)

THE NEW SCIENCE OF PERSPECTIVES

Bertalanffy's idea was to transfer a personal reference of a single entity to the personal perspective of

what has been called “wholistic” conceptualization. Instead of looking entirely at what a something is, the emphasis is placed on what a something is doing in a wholistic relationship with something else. In a sense, systemics is a marriage.

INTERNATIONAL SOCIETY OF GENERAL SYSTEM RESEARCH

THERE IS NO “GENERAL” “THEORY”

There are a significant number of systemic ideas/concepts. Charles Francois published an International Encyclopedia of Systems and Cybernetics which describes in great detail the work for a formulation of general systems theory. It has been noted that usage of the word “theory” is a translation of the German “theorie” which has a more generalized meaning to a German reader. Our usage of the term has strict requirements which has confused the research toward a general system theory. It should be obvious that there can be no “general theory” of everything but it can be that there always is a general principle.

It should be obvious to us all, that the technical expertise to create the Universe and Us is not ordinary. It only can be logically explained by a principle.

That principle would have to be the simplest in order to explain the simplest versions.

HISTORY

A society was formed by five participants of a conference. This society consists today of hundreds of members from all walks of life who submit a paper to be read at an annual conference. The structure of the society is mainly set up to hold that annual meeting. The annual meeting is organized by an elected president. The new incoming president begins as the vice president. Other responsibilities are handled by elected or appointed offices of the Treasurer and Secretary. The “office” today is located in England.

There are two levels of participation, One would be the interaction with the society itself and the other are localized societies/teacher responsibilities. There are also Societies located in nearly every country. Participation in the work of the society is usually writing a paper and presenting it at the annual meeting held in July of each year.

The participants reflect a wide range of participants. There is even the study of a book in a systemic way. Aren't all books written in a systemic way???

The history of “modern” systemics as a science can be traced to the establishment of ISGSR which at that time led to the assumption that there is, in fact, a General Systems Theory. To this day no such theory has been found. It is the contention made here in this paper, that a general system theory cannot be about particulars. However a “General Principle” has been spoken of from the very beginnings of our history, particularly in Chinese thought as well as early Greek philosophies.

This requirement of particularized science does not, however, apply to a philosophical stipulation that a system consists of interactions between elements forming wholes. And therefore while a specific scientific version cannot be general, a general version can be stated in a philosophical way without reference to any particular element by simply stating that “a system is made of elements in standing

relationships". That is how Bertalanffy said it. So when the particulars are added in, the generality is lost.

No particular formulation can be general.

We are talking about the conceptualization as produced by the mentality of the brain. We are talking about the minimum requirements of a conceptualizing process.. Traditional Science has strived to understand a part of the Universe. Systems philosophy strives to understand the interaction between at least two parts as a whole in a relationship with the environment.

This has been discussed by Fritjof Capra.

"In contrast to the mechanistic Cartesian view of the world, the world-view emerging from modern physics can be characterized by words like organic, holistic, and ecological. It might also be called a systems view, in the sense of general systems theory. The universe is no longer seen as a machine, made up of a multitude of objects, but has to be pictured as one indivisible dynamic whole whose parts are essentially interrelated and can be understood only as patterns of a cosmic process". [6]

It is obvious that the new science will not contradict/destroy what research has been done, instead it will enhance our description of what is happening in our Universe. The new revolution of scientific knowledge does not involve some sort of new matter/stuff, it involves a new perspective, that of working together.

So the secret we all look for is not a mystery to be solved, instead it is looking at how stuff works together. It is not a "theory" confined to a particular aspect,. It is a description of how stuff works together.

Alfred North Whitehead clarifies the pur[ose of philosopher: "While each scientific theory selects out and abstracts from the world's complexity a peculiar set of relations, philosophy cannot favor any particular region of human enterprise. Through conceptual experimentation it must construct a consistency that can accommodate all dimensions of experience, whether they belong to physics, physiology, psychology, biology, ethics, etc.." (-)

Attempts to find the general system have been problematic due to complexity complications. Does the simultaneous involvement of three sub-systems invalidate the simpler system of two sub-systems?

Numerous achievements have been proposed and utilized. TOP has been proposed by Hal Linstone. T is for technical, O is for organization, and P is for personal. It is in this way that he proposes to consider the various aspects of system inquiry.

CLAP is a system model proposed by this writer. The formulation looks like C = L(A< P) "C" is the whole, while "L" is the *integrating* re;relationship between the elements "A" and "P".

Other formulations of systemic thinking have been developed by many systemists.

Reaction to this principle varies. Some have never heard of it and do not suppose that, their ordinary thought processes even suggests such a methodology. Some others are looking for it, but they do not know what it looks like. Sometimes they find parts of it, and often declare that part is the whole. They see the two sides of a coin and assume that is all there is. A few others have a holistic grasp of the

principle and a few can actually put it to work, There is a reason for that. It is not that there is a rejection of the concept, what is real is when the interaction occurs. So our language has two ways of being expressed – a name or an interaction. Just like comparing John and father.

This authors experience of those others, some of them, is that they do not have the notion of a system in their head. To them, all this will make no sense. For some of the others, they will look for something new, not yet having an idea of what it is. A few will recognize the attributes of the system, Sometimes they will think what they think is all there is to think, A few will continue to look. Finally some will see the whole picture. What is so ironic is the it is the simplest of all forms.

Bertalanffy says

'There is this hope, I cannot promise you whether or when it will be realized - that the mechanistic paradigm, with all its implications in science as well as in society and our own private life, will be replaced by an organismic or systems paradigm that will offer new pathways for our presently schizophrenic and self-destructive civilization." [4]

I used to think that all we had to do is state it simply. Obviously the notion would be accepted and then go on working from there. However, after spending some time on a listserv, and during that time have on several occasions stated the story of the system, Well, some do listen. But all the rest appeared to ignore what they just learned. Even the one who talks about a dualism with some kind of relationship does not want to make the leap from an isolated concept to the notion of working together.

Working together is an action involving not one, but at least two. In many cases two is enough. In some cases two is not enough. The DNA code does not limit itself to two, because two does not give enough to produce the 22 amino acids. Three does. So the DNA word consists of three strings of DNA codons. Yet every other aspect of DNA forms a complementary structure.

Biologist Arthur Kornberg writes*, "The most important feature of the duplex model for DNA structure is the introduction of the concept of complementarity. It provided the explanation for accurate replication of a very long chain. This inherent feature of DNA structure is the basis of not only of its replication but also of its capacity to transmit information. Complementarity has come to explain transcription and translation and thus the entire sequence of events in the expression og genetic functions. It is also the basis for exchange of DNA segments between chromosomes in several forms of recombination."*

The vast blueprint of all life works by working together.

David Bohm reminds us;

"Indeed, to some extent it has always been necessary and proper for man, in his thinking, to divide things up, if we tried to deal with the whole of reality at once, we would be swamped. However when this mode of thought is applied more broadly to man's notion of himself and the whole world in which he lives, (i.e. in his world-view) then man ceases to regard the resultant divisions as merely useful or convenient and begins to see and experience himself and this world as actually constituted of separately existing fragments. What is needed is a relativistic theory, to give up altogether the notion that the world is constituted of basic objects or building blocks. Rather one has to view the world in terms of universal flux of events and processes." [5]

The difficulty most seekers encounter is due to an unusual consideration on the language being used to describe whatever, To use language means to separate the wholes into parts. But then the question arises about how to put the parts back together. It could be like converting a noun into a verbing.

Fritjof Capra writes**:** *"In contrast to the mechanistic Cartesian view of the world, the world-view emerging from modern physics can be characterized by words like organic, holistic, and ecological. It might also be called a systems view, in the sense of general systems theory. The universe is no longer seen as a machine, made up of a multitude of objects, but has to be pictured as one indivisible dynamic whole whose parts are essentially interrelated and can be understood only as patterns of a cosmic process".* [6]

Erwin Schoedinger reminds us**:** *"Let us now return to our ultimate particles and to small organizations of particles as atoms or small molecules. The old idea about them was that their individuality was based on the identity of matter in them...The new idea is that what is permanent in these ultimate particles or small aggregates is their shape and organization. The habit of everyday language deceives us and seems to require, whenever we hear the word shape or form of something. that it must be a material substratum is required to take on a shape. Scientifically this habit goes back to Aristotle, his causa materialis and causa formalis. But when you come to the ultimate particles constituting matter, there seems to be no point in thinking of them again as consisting of some material. They are as it were, pure shape, nothing but shape; what turns up again and again in successive observations is this shape, not an individual speck of material...*

GERARD t'HOOFT

"A long standing ambition of physicists is to construct a single master theory that would incorporate all the known forces. One imagines that such a theory would reveal some deep connection between the various forces while accounting for their apparent diversity. Such a unification has not been attained, but in recent years some progress may have been made...What may ultimately prove more important, all four forces are now described by means of theories that have the same general form. Thus if physicists have yet to find a single key that fits all the known locks, at least all the needed keys can be cut from the same blank." [13]

CONCLUSIONS

There is a principle of operation in the Universe. But if we look at this principle in terms of actual things, the principle is lost in the mirror of reflection. Once we are able to see it, it disappears.

There are two ways a scientist may perceive our reality. One way is to look at parts. They say there must be a universal part but none have been found. The other way described herein is to look at what parts do to each other. And that way is the secret we wish to explain. We live in a world of things, but what is happenin' is what those things are doing together.

The end result of this movement from the object to the relationships between objects is a perspective change by the scientist involved. The change involves more than a study of a thing, instead it is a study of how things interact with each other. Much of the problem, if not all of it, emerges from our usage of our language. Traditional science deals with parts. Their goal is to find the ultimate particle. But organismic science not only deals with the part, but also that other part the first is in an interrelationship with as well as the emergent whole. The difference is the difference between a noun

and a verb, A noun is what we call a thing, a verb is what the thing is doing.

At the time the first paper was written, a defining situation was encountered and solved by the Primer Group. The problem was trying to define a concept in both general and specific terms. To do so does not result in a truth. What we did as part of the Primer's work was to create a complementary definition consisting of two approaches. Part A is a general definition while Part B is a specific definition. We start by being as general as we can get without leaving anything out. This is what was written at that time.

THE MODERN SYSTEM

The Primer, charged with the role of defining a system, defines it as "a family" of meaningful relationships among the members, acting as a whole…" A whole-system is a family in a meaningful relationship with its environment as a whole.

Here are the secondary elements of systems, our part "B"

Systems, (from the Four Directions of Philosophy, Theory, Methodology and Application), as a family of meaningful relationships among the members acting as a whole and possessing organization as a process with aspects determined by boundaries of information and control as set by the observer according to subjective and objective considerations that might be static or dynamic, with qualities or quantities that are simplicity compared relatively to complexity expressing itself as a closed and/or open system having form and function which can have emergent effects creating an evolution or devolution depending on internal or external relationships utilizing differentiation and integration to form order out of chaoic behavior all at once over a period of time.

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PART TWO

I am including this paper I presented in 1995 to ISSS, because it presents a detailed perspective of the question, “Is there a general system?” And it has a very positive review by Charles Francois.

Dear Tom: "You made a fine start...That first draft of yours is beautiful. I am in complete agreement with your way to understand (and explain) the systemic view. It is an original and powerful synthesis. Also your historical synthesis is of utmost interest. Your quotes are a wonderful selection and always precisely on the point. As a general introduction I think it can be used without any serious modification at all."

Charles Francois Editor, International Encyclopedia of Cybernetics and Systemics

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IS THERE A GENERAL SYSTEM?

By Thomas Mandel

FORWORD

ALBERT EINSTEIN

"A human being is part of the Whole...He experiences himself, his thoughts and feelings, as something separated from the rest...a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. Nobody is able to achieve this completely, but the striving for such achievement is, in itself, a part of the liberation and a foundation for inner security". [11]

INTRODUCTION

"*My friend, all theory is gray, and the Golden tree of life is green." Goethe*

TIME TO BE INTEGRATING

It is time we, especially we in the systems movement, stop fighting amongst ourselves. It is time we unify our principles in the true Bertalanffy tradition, not as disparate and competitive systems, but as aspects of one whole. A house divided against itself will collapse, and history is not kind to fallen

theories. We are, above all, if we believe our own precepts, a whole, a meaningful family, if you will, and what we do to others we do onto ourselves. To separate "us from them" is to separate everything. "Separate" is not a operational systemic term. It is time to become the whole that we already are.

Fritjof Capra talks about a new direction science is moving in*: "In contrast to the mechanistic Cartesian view of the world, the world-view emerging from modern physics can be characterized by words like organic, holistic, and ecological. It might also be called a systems view, in the sense of general systems theory. The universe is no longer seen as a machine, made up of a multitude of objects, but has to be pictured as one indivisible dynamic whole whose parts are essentially interrelated and can be understood only as patterns of a cosmic process".* [6]

GENERAL SYSTEM THEORY PRINCIPLE

The subject of a General Principle, a.k.a. General Systems Theory, is at the root of ISSS's work. Yet little has been done at this most general level. Most systemicists have accepted Bertalanffy's minimal definition - elements, relations and wholes - going on from there to derive their particular system; for example, as Anderson & Carter (1984) write, "Systems models of various kinds are used in many fields besides sociology, so a social system can be thought of as a special case of a more general system model."(1).

But some others go on to create an entire new general system of their own, which they attain by particularizing the general definition somewhat, in effect creating a "sister" GST. For example, the Principia Cybernetica Project within ISSS itself holds, "...that in our time, the age of information, it is systems science and cybernetics, as the general sciences of organization and communication, that can provide the basis for contemporary philosophy." (ISSS Bulletin, 1994, Winter, pp.52.)

The former derivative process results in the same thing being said but in different ways. The latter inventive process, unfortunately, is populated by many who would modify the general system by introducing "something new." This "invention," often contains incorrect assumptions subsequently leading to errors making it difficult if not impossible to understand and use their systems. ISSS has hundreds of such "theories" on record.

Clearly, if in fact there is a General System "out there" our task would be not to "invent" unique conceptual theories, but to describe what we have discovered the best we can. And if in fact there is a general system, it is "necessary" that it can be explained in myriad of ways, yet all will be using the same principle. A General System requires a General Principle. Do we find such a "principle" just about anywhere we look?

Alfred North Whitehead reminds us**:** *"While each scientific theory selects out and abstracts from the world's complexity a peculiar set of relations, philosophy cannot favor any particular region of human enterprise. Through conceptual experimentation it must construct a consistency that can accommodate all dimensions of experience, whether they belong to physics, physiology, psychology, biology, ethics, etc.." (-)*

THE BERTALANFFY VISION

General System Theory, as a science, was formulated by Ludwig von Bertalanffy at the end of the second world war. It was he who formalized the general concepts of General Systems into the science of Systems. While modern systems has a produced a wealth of system, Bertalanffy's premise still holds. What is new is a new emphasis, not so much on "things" anymore, as it is on their relationships, the "patterns," and then, on the whole.

Bertalanffy was not the first, however, to see the patterns of nature, nor was he even the first to see a general pattern. Systems design was discussed by Lao Tzu as early as the 6th Century B.C. The earliest system, the Chinese Yin/Yang is five thousand years old. Now, as we approach the 21st Century, there are hundreds of "systems" under study conceived of either independently or as a result of Bertalanffy's work. The major problem Bertalanffy spoke of long ago, nevertheless, still remains to this day. He said then,

Ludwig von Bertalanffy explains his viewpoint*: "Our civilization seems to be suffering a second curse of Babel: Just as the human race builds a tower of knowledge that reaches to the heavens, we are stricken by a malady in which we find ourselves attempting to communicate with each other in countless tongues of scientific specialization... The only goal of science appeared to be analytical, i.e., the splitting up of reality into ever smaller units and the isolation of individual causal trains...We may state as characteristic of modern science that this scheme of isolable units acting in one-way causality has proven to be insufficient. Hence the appearance, in all fields of science, of notions like wholeness, holistic, organismic, gestalt, etc., which all signify that, in the last resort, we must think in terms of systems of elements in mutual interaction..." [8]*

It is suggested here, as it has been in numerous other studies that the crisis science and humankind are facing in general is much more profound than the difficulty experienced trying to understand different languages. It's not what is written in the language, but the language itself that is problematic. Things are what they do, not what we call them, unless one believes that what we call them is all they do...

"General Systems theory should be an important means of instigating the transfer of principles from one field to another (so that it would) no longer be necessary to duplicate the discovery of the same principles in different fields." [8]

Bertalanffy had a vision, a dream that spoke of a greater problem than just the efficiency of knowledge transferal. His perspective was a humanist perspective, a reconstruction of the individual not as a separate entity in a struggle against the world, but in a resonance with the universe.

'There is this hope, I cannot promise you whether or when it will be realized - that the mechanistic paradigm, with all its implications in science as well as in society and our own private life, will be replaced by an organismic or systems paradigm that will offer new pathways for our presently schizophrenic and self-destructive civilization." [4]

THE THEORY OF RELATIONSHIPS

David Bohm points out**:** *"Indeed, to some extent it has always been necessary and proper for man, in his thinking, to divide things up, if we tried to deal with the whole of reality at once, we would be swamped. However when this mode of thought is applied more broadly to man's notion of himself and the whole world in which he lives, (i.e. in his world-view) then man ceases to regard the resultant divisions as merely useful or convenient and begins to see and experience himself and this world as actually constituted of separately existing fragments. What is needed is a relativistic theory, to give up*

altogether the notion that the world is constituted of basic objects or building blocks. Rather one has to view the world in terms of universal flux of events and processes." [5]

MODERN DARK AGE

We in the systems sciences should be greatly concerned that we may be in a micro-Dark Age brought on by a faulty ontological assumption. True systems thinking, if it is to include natural systems, is a radical departure from the old atomistic thinking that has brought science this far. Systemics, insofar as it would be a mirror of reality, is not just about simply organizing separate entities into something we call a whole (as if it were merely a theory of organizations.) Indeed, the most significant difference between the old and the new is that the "old" fundamental concept of separateness i.e., "things," is not a part of systemic ontology (basis of existence). The ontological basis of being, the object, is not the basis of being in systemics. Look at the black and white of this page, then look at what they are doing, that is how different the new system's thinking is from the old. A door not in use is functionally a wall.

A THING IS A "FLOW-MATE"

Systems thinking's fundamental concept is the connecting relationship - what things are doing to each other. For example computer Bytes are made of Bits in a meaningful relationship. We never see the Bits themselves, nor do we take them for granted. In a sense of Tao, the Bits, the things, are "flow-mates." (20) A thing is a relationship inside out, so to speak; or, better yet, outside in...

THINGS ARE WHAT THINGS ARE DOING

The bottom line is that ultimately things, entities, are, internally, relationships. Classical Ontological existence depends on "qualities" such as color. But the qualities are actually emergent properties of the relationship between relational elements being perceived by us as a different "logical type." It is the expressive relationships (Simplexities), which we perceive as a thing (Simplicites). Therefore, the ontological idea of an "entity" as a disconnected isolated concept is not general enough. This suggests that Classical ontology, as the ontology of all Existence, has no actual basis. This idea is not new, "Maya" is one word to historically describe this particular illusion or "misplaced concreteness."

RELATIONAL WORDS

It follows we need a language of relationships, a language that everyone can understand. We propose that such a transdisciplinary relational-language can be found in the ordinary and simple language. Indeed, there is already an "Ordinary-Language Philosophy." Wittgenstein has spoken of deriving the meaning of a statement from the contextual relationships between the words. Is is really necessary to create words having a precise meaning, and then not understand them? Or is better to use ordinary words in a contextual way (if you want to be consistent with systemic relational principles) and be able to figure them out? Of particular interest to us are the natural relational-terms, like father or son, or daughter, or sister, or acquaintance, which describe a particular relationship. If we need to create words. they could be functional equivalents of these "friendly" words. Family is such a relational term, that not only describes a whole, but implies all that is implied by our personal idea of what a family is. In a general sense, a system is a family. In a more specific case, a system is a family of relationships. In the sense of what is asked by this paper, General System Science is the family of families. This is not to be unexpected - a system of systems which merge into systems will end up as one system.

A GENERAL SYSTEM APPROACH IS NOT NEW

The idea of a General System is not necessarily new. If we discard our cultural and spiritual affinities, the concept of a General System can be traced back five thousand years to when the Chinese Yin/Yang was first conceived. Since that time, many writers, East and West, have spoken of a General System, although most if not all of their systems have been stated in the cultural specific language of the author. It is this necessary particularity that limits and confines the system to his culture and subsequently eliminates the generality. We call it the problem of "Misplaced Generality."

GREEK SYSTEMS RECONSTRUCTED

The elements of a General Systems View can also be found in the early philosophical writings of the Greeks. That is if we reinterpret them as such. We are going to apply the principles of contextual relations and general systems principles to our first philosophies and see what comes up. It is well worth returning to that early beginning stage, where the axiom "start straight" would apply.

THALES, THE FATHER OF SCIENCE IN 585 B.C.

It is rumored that Thales was the first to predict an eclipse on the 28th of May, 585 B.C.. And in fact it did occur. Because there was no distinction between what was philosophy and what was science at that early time, it can be said Thales conducted the first experiment and thus would be the father of science, and May 28th, 585 B.C. would be the birthday. Isaac Asimov also held this view.

Around 585 B.C. Thales of Miletus formulated Western civilization's first philosophy in an attempt to break from the mythical gods of Homer and Hesiod. His rational explanation/prediction was the first to replace the magical creation of the Cosmos by the various gods. His idea was simple: the world was constructed of a kind of "stuff", a single thing that made up the world, much like WATER made up the oceans.

But knowledge was not meant to stop evolving and soon afterwards Thales' student, Anaximander, took issue with Thales's model of stuff, water, suggesting that there also was an infinite quality, the Boundless, which was then further modified by Anaximenes to include a specificness about it, much like AIR.

FIRE, "FOR EXAMPLE"

Heraclitus then surmised that Change was an important part of the total picture, a movement from one thing to another much like FIRE consumes and creates new forms of matter. He also spoke of them as the opposites, "What is in opposition, is in concert."

A fifth Ionian philosopher, Empedocles, decided that all of these concepts should be integrated into a whole to include the many not unlike the EARTH integrates all forms of matter. Furthermore, these forces were modulated by the forces of love and hate. Hence the concept of Water, Air, Fire, and Earth was born.

Very little of what Thales actually wrote has been found. What we do have is a verbal account given us by Aristotle. Aristotle's interpretation, however, leads one to believe the four elements actually existed as things, that water, air, fire and earth were actual elements which everything was made of. He also added a fifth celestial sphere, presumably to make it original.

Unfortunately, Aristotle's atomistic treatment of the Ionian philosopher's System as "four elements" -- Water, Air, Fire and Earth missed the point. His approach of four distinct things resulted in a stagnant "elemental" age that lasted more than 1500 years as science sought, instead, to make gold. Secretly of course. Unprofitably, at end...

GREEK SYSTEMS APPROACH?

But what if water was merely an example of Thales "Stuff?" And what if air also was an example of the Boundless? And what if fire was an example of Change rather than the accepted version that everything was fire? And what if earth was an example of what happens when you put all these Together? We would have a Greek General Systems Theory that would rival any we have today, at least of the general sort.

Indeed, if we interpret these elements in this relational manner, we find that we have two primary elements, water and air, which combine like fire combines, the whole of which is one, like the earth. Certainly this idea is not different from our own general system principles. Could they have gotten it right to begin with? There is evidence that such a scenario could have existed.

COMPLICATIONS

So far we have discussed the material nature of the world. They story didn't end there. The idea of "mind" arose in Greek thought soon after the material. It was easy to imagine that such a thing existed. Protagoras reasoned that "man is the measure," while Anaxagoras believed in "mind or Nous." Socretes declined to comment on the material nature of the universe, instead used Nous and man to develop the concept of the "Soul" which existed inside of man. At the same time, Gorgias concluded that everything was relative and literally gave up. Aristotle adopted the material, but saw it as entity, not system.

Similarly, Plato's exclusion of the material in his Idealistic perspective stunted the evolution of knowledge of that complementarity of mind/matter, resulting in a illusory Cartesian division of reality. A dualism that has persisted to this very day. And so the stage was set - unity was stated in the dualistic terms - mind and body. This chasm would express itself throughout the ages as the conflict between Idealism and Materialism.

THE ATOMOS THEORY

Thales Theory of Stuff led to a different, and most well known theory of the Atom or Atomos. This theory was not at all well known at its beginning, however. Leucippus and Democritus formulated the original theory of the atom, conceiving of it as a bit or atomos existing in a space. Obviously this is a special case of Thales more general model (Schroedinger also made this comparison.), but not of systems as it leaves out their relationship. The theory went nowhere as it was ridiculed by Aristotle severely (Aristotle even wanted to burn Democritus' books.) Fortunately, The philosopher Epicurus wrote of the Atomos concept incorporating it into his philosophy, but that philosophy died off, and with it went the atom theory. Around the turn of the millennium, he Roman poet Leucretius came across the writings of Epicurus and wrote the long poem "On the Nature of Things." which incorporated the theory of Atomos. This poem was lost, and with it, all reference to the atom during the dark ages. It would remain hidden for centuries until a French philosopher Gassendi found it and passed it on to Boyle, (I believe), and eventually became the second book published on the Gutenberg Press. The poem was read by Dalton who then modernized the theory of the atom, retaining the name

"atom" out of deference to the earlier Greek theory of Atomos.

Ironically, many scientists chose not to believe in the atom, and general acceptance didn't occur until 1895 when the electron was found. The final proof of the atom's existence was provided by Einstein in his Brownian Motion paper which ironically used the same principle "dancing motes of dust in a beam of sunlight " (in his Brownian motion paper) that Leucrtius used in his poem two thousand years earlier.

As physicists delved into the interior of the atom, theory after theory crumbled to dust. The absoluteness of Newtonian physics was shattered when space and time were found to be aspects of each other rather than the separate absolute entities Newton claimed they were. The accepted methodology of science was proven inadequate and had to be fundamentally changed by Planck's concept of quanta - a unit of action. Finally, the ontological basis of Identity was disrupted, if not washed away, by Bohr's complementarity. The Wavacle, described in strict classical terms, is and isn't, contrary to Aristotle's law of the excluded middle. Yes, a thing can be a thing and not a thing at the same time. Furthermore, as science began to delve even further into the interior of the atom, looking for the ultimate particle everything must be made of, they found no entity, i.e., matter, what they found, succinctly put by Erwin Schroedinger, one of the founders of Quantum mechanics, was, "Form, not substance - the ultimate concept." The atom is not a stuff after all...

Erwin Schrodinger makes a point: *"Let us now return to our ultimate particles and to small organizations of particles as atoms or small molecules. The old idea about them was that their individuality was based on the identity of matter in them...The new idea is that what is permanent in these ultimate particles or small aggregates is their shape and organization. The habit of everyday language deceives us and seems to require, whenever we hear the word shape or form of something. that it must be a material substratum is required to take on a shape. Scientifically this habit goes back to Aristotle, his causa materialis and causa formalis. But when you come to the ultimate particles constituting matter, there seems to be no point in thinking of them again as consisting of some material. They are as it were, pure shape, nothing but shape; what turns up again and again in successive observations is this shape, not an individual speck of material...*

...On the other hand...the mere contention that every observation depends on both the subject and the object, which are inextricably interwoven - this contention is hardly new, it is almost as old as science itself...But I must mention one point, in order not to be accused of injustice towards the quantum physicists of our days. I said their statement that in perception and observation subject and object are inextricably interwoven is hardly new. But they could make a case that something about it is new. I think it is true that in previous centuries, when discussing this question, one mostly had in mind two things, viz. (a) a direct physical impression caused by the object in the subject, and, (b) the state of the subject that receives the impression. As against this, in the present order of ideas the direct physical causal, influence between the two is regarded as mutual. It is said that there is also an unavoidable and uncontrollable impression from the side of the subject onto the object. This aspect is new, and, I should say, more adequate anyhow. For physical action is always inter-action. It always is mutual. " [19]

PATTERNS THAT CONNECT

Instead the parts, or things, that ontologically must exist, the physicists found patterns. Instead of a single element of everything, the physicists found a relationship between different things. Instead of bits and pieces, the physicists found the whole. A new physics was born. (Eventually it would be found

that the new physics must include the old, but both as aspects rather than separate absolutes.) Gregory Bateson explains it this way: *"My central thesis can now be approached in words. The pattern which connects is a metapattern. It is a pattern of patterns. It is that metapattern which defines the vast generalization that, indeed, it is patterns which connect." [3]*

PRE-POST-MODERN QUANTA PHYSICS

Hintz Pagels forwarns us: "We live in the wake of a physics revolution comparable to the Copernican demolition of the anthropocentric world -- a revolution which began with the invention of the theory of relativity and quantum mechanics in the first decades of this century and which has left most educated people behind" .[0]

Several hundred books have been written about the quantum revolution in elementary physics. The simplicity of the object under study reduced the variables to a minimum, and thus the problems of investigation were likewise reduced to their minimums. For a long time enigma after enigma emerged, until finally a new paradigm emerged. While several excellent summaries of this paradigm shift have been published, Capra's approach fits best with what we are doing in the General Systems Sciences. In 1976, Fritjof Capra wrote "The Tao of Physics" in which he described the parallels in Eastern thought and Quantum Physics in the common and ordinary language. This book set off a continuing stream of ordinary language philosophical interpretations of Quantum Physics written in ordinary language for the lay public There also was a resurgence of talk about the Secret of the Universe, a concept that has settled around the terms Theory of Everything. Below are excerpts taken from his books and lectures. It is, in our sense, The Best of Systems Thinking from the point of view of physics.

Fritdof Capra writes*: "The dramatic change in concepts and ideas that happened in physics during the first three decades of this century has been widely discussed by physicists and philosophers for more than fifty years...The intellectual crisis of quantum physicists in the 1920's is mirrored today by a similar but much broader cultural crisis. The major problems of our time...are all different facets of one single crisis, which is essentially a crisis of perception...Like the crisis in quantum physics, it derives from the fact that most of us. and especially our large social institutions, subscribe to the concepts of an outdated world view...At the same time researchers...are developing a new vision of reality...What we are seeing today is a shift of paradigms not only within science but also in the larger social arena...The social paradigm now receding had dominated our culture for several hundred years, during which it shaped our modern Western society and has significantly influenced the rest of the world...This paradigm consists of...the view of the world as a mechanical system, the view of the body as a machine...the view of life as a competitive struggle...the belief of unlimited of unlimited progress achieved through economic and technological growth and the belief that the female is subsumed under the male...During recent decades all these assumptions have been severely limited and in need of radical revision. Indeed, such a revision is now taking place...In science, the language of systems theory. and especially the theory of living systems, seems to provide the most appropriate formulation of the new ecological paradigm. I would like to now specify what is meant by the systems approach...I shall identify five criteria of systems approach...1. Shift from the parts to the whole. The properties of the parts can be understood only from the dynamics of the whole. In fact, ultimately there are no parts at all 2. Shift from the structure to the process. In the new paradigm, every structure is seen as a manifestation of an underlying process. 3. Shift from objective to epistemic science. In the new paradigm, it is believed the epistemology - the understanding of the process of knowledge - has to be included explicitly in the description of natural phenomenon...4. A shift from building to networks as a metaphor of knowledge. In the new paradigm, the metaphor of knowledge as a building is being replaced by that of the network. 5. Shift from truth to approximate descriptions. This insight is crucial*

to all modern science...in the new paradigm, it is recognized that all scientific concepts and theories are limited and approximate...One of the most important insights of the new systems theory is that life and cognition are inseparable. The process of knowledge is also the process of self-organization, that is, the process of life. Our conventional model of knowledge is one of representation or an image of independently existing facts which is the model derived from classical physics. From, the new systems point of view, knowledge is a part of the process of life, of a dialogue between subject and object. I believe that the world view implied by modern physics is inconsistent with our present society, which does not reflect the interrelatedness we observe in nature. To achieve such a state of dynamic balance, a radically different social and economic structure will be needed; a cultural revolution in the true sense of the word. The survival of our whole civilization may depend on whether we can bring about such a change. It will depend ultimately, on our ability to...experience the wholeness of nature and the art of living with it in harmony." [7]

(The cutting edge experiment today is Bell's Theorem, and its philosophical implications are that either there is faster than light travel (arrives before it left), or, b, subatomic particles remain as a whole even while separated by any distance.)

RE-INTRODUCTION

WHERE THERE IS WEST, THERE IS EAST.

While Western civilization began on the shore of the Nile and Euphrates river deltas, there also arose a Eastern civilization on the shores of the Yangtze river delta, now known as China. Five thousand years ago, a document was produced introducing the art of acupuncture. In this document reference was made to the Chinese system known a the Yin/Yang. This symbol is said to be a birds eye view of a mountain, with dark and light side. The form of their symbol implies a movement of the light around the mountain, a flow, if you will. Indeed, the essence of their system is about movement or flow.

Around the time (3OO-500 B.C.) about when Heraclitus was formulating his concepts of change, or thereabouts, the Chinese were hard at work formulating their own system but using pictures to write it down. The Tao Te Ching is thought to be authored by either a group of writers or by the man called Lao Tzu. It doesn't matter now who wrote it, what mattered was that at nearly the same time in history, while the Greeks were thinking about their system of earth, the Chinese were also writing down their system. Thousands of miles away, someone wrote down these words. Compare them to the whole of the pre-Socratic Greek systems philosophy we have speculated on above --

Written down in the ancient book, Tao Te Ching, Chapter 42, Lao Tzu wrote:

"The Tao begot one, one begot two, two begot three. The three begot the ten thousand things. The ten thousand things embrace Yin and express Yang. Harmony is achieved by combining these forces." [12]

Compare this to the Greek idea of stuff and space and a relationship as a whole according to the principles of love and hate. One made two and two is of three and three are many and many are harmonized by Yin/Yang. Systemically, they are the same.

THE MODERN SYSTEM

Isn't it interesting that the Chinese have written up a system five thousand years ago, and to this day it hasn't changed? Moreover, nearly every Chinese book written refers to this concept, clearly it is useful

to them.

Isn't there an extraordinary range of "twos" not only in our literature, but nature as well? What about complementarity? The opposites? Why was Dualism so popular? Where did it fail? Subject - object?

What about that memory trick - "association?" Why is it easier to remember two things than it is to remember one? And what about "this and that?" And everyone knows there are two sides to every coin.

Madden says in "The Structure of Scientific Thought" (1960, p6) "...let us say, as a simple approximation, that a law is a functional relationship between two independently meaningful variables." Minski also observed this in his book, I forgot the name, in the Glossary under interactionaism, "...I find it curious that most of all laws have been stated as the interaction between two elements, hardly any are in terms or three or more."

Why is cell division always into two parts? Is it because two is a part of that particular process? Or is because two is a necessary? And isn't DNA a complementarity?

MODULATE TWO TO GET THREE?

And why is that the one of the few exceptions to the two rule is color? Not all things come in pairs, there are three primary colors. Ah, an inconsistency. Of course we could look at them as merely different vibratory frequencies, and there is our two. But let us work this through.

Yes, color is made of three primary's, not two. But most colors are made from two, not three, right? At least that is how it is when I adjust the filters on my color enlarger. Only two of the three are manipulated - never all three. But how the eye deals with those three is most interesting of all. Those three primaries are matched, as would be expected, by three corresponding cones in the eye, one cone for each of the three colors. Wouldn't we also expect the pathways from those cones to the brain to follow this triple scenario? They do not. Instead of three pathways for three colors from the eye to the brain, there are two. The third pathway is achieved by a modulation of the two. If in fact this is confirmed to be the case, this inconsistency might be a proof. It is at the least a significant clue.

Of all these examples, the simplest but the most profound is the fact that it takes at least two somethings to create a difference. To produce news of difference, i.e., information, there must be two entities real or imagined) such that the difference between them can be immanent in their mutual relationships; and the whole affair must be such that news of their difference can be represented as a difference inside some information-processing entity, such as a brain, or, perhaps, a computer. "To what questions have fifty years of science led me? This chapter has defined and exemplified a manner of search and therefore it is the moment to raise two questions; For what am I searching? To what questions have fifty years of science led me. The manner of search is plain to me, it might be called the method of double or multiple comparison."Thus the whole, in which such instances are placed...become a display inviting the reader to achieve insight by comparing instances one with another,"[3]

STEWARD & COHEN & SIMPLEXITY

"The central aim of science is to render the complexities of the universe transparent, so that we can see through them to the simplicities beneath...We have to find a way to combine content and context, reductionism and high-level-features, into a seamless whole. We think that the key is to understand

complicity, not as an incredibly complex reductionist network, but as the interaction of features within different spaces of the possible...So what we need is a theory of features...We must find a theory of mathematical complicity between the quantitative and the qualitative. [28]

"~~THEORY~~ OF EVERYTHING"

Part of the post-quantum physics dialog centers around the search for a Theory of Everything as John D Barrow (1991) outlines in his book, "Theories of Everything, The Quest For Ultimate Explanation." Following is a selection of excerpts that tell his story:

"...modern scientists believed thay have stumbled upon a key. a "monumental Theory of Everything."..a theory of everything which will unite all the laws of nature into a single expression... an abbreviated representation of the logic behind the universe's properties...a single coherent framework...an encapsulation of all the laws of nature...a simple and single representation...the ultimate directory...an independent prescription which appeals to simplicity, naturalness and economy...a union of perfect and unique intercompatibility..a general principle...which can be applied in a variety of different situations without becoming embroiled in their pecularities...Perhaps there exist a whole set of basic rules about the development of complexity which reduce to some of our simpler laws of nature in situations where the level of complexity is essential nil. If such rules do exist, then they are not like the laws which the particle physicists seek. But is there any evidence that such principles exist? A collection of 1027 protons, neutrons and electrons may be all that a desktop computer is at some level, but clearly the way in which those subatomic particles are put together, is what distinguishes the computer from a crowd of 1027 separate subatomic particles. ...The question of the existence of a "secret of the Universe" amounts to discovering whether there is some deep principle from which all other knowledge of the physical world follows..."

But the story of science here does not end here, for Barrow concludes his book with the last statement:

"There is no formula that can deliver all truth, all harmony, all simplicity. No Theory of Everything can ever provide total insight, for to see through everything would leave us seeing nothing at all." [2]

Barrow is right as far as he goes. No particular Theory of science will ever be general. Science, by definition, cannot explain everything. The Principle of Verification, which is the cornerstone of empirical science, requires specifics. It is these specifics that preclude generality. Specifics replace generality (misplaced generality.)

PRINCIPLE OF EVERYTHING

This problem is old news to General Systems people. The Primer Group in ISSS is presently dialoging on a general definition of System(s) in preparation for our ISSS General Systems Primer. Our work has led us to the conclusion that the idea of a General System "Theory" is wrong. The terms "General" and "Theory" are exclusionary - they cannot be stated at the same time. A General System "Principle" is a different story, and not even one that we question; Bertalanffy himself said that the science of Systems is about finding general principles. So their "Theory of Everything" is our "Principle of Everything." We know what it is, we just don't know how to say it in a way that everyone would understand. Or do we?

AUTOPOETIC GENERAL PART (A) DEFINITION OF GENERAL SYSTEM SCIENCE

We in the Primer Group, have been able, through transdiscliplinary collaboration, to deconstruct and reconstruct a two-part complementary dialectical process-based definition of the General System that has none of the pitfalls a strictly scientific version faces. We are approaching the definition Problem by simply having both a general and a particular as opposed to having both together. Our postmodern definition, supported by general field theory, can be grasped in one word - Family. And, we are pleased to report, it works... (14)

ISSS PRIMER GROUP

"A System is a Family of Meaningful Relationships (between the members acting as one whole.)"

CONCLUSION

While knowledge in Western civilization started out unified at the beginning of recorded history, the division into the separate aspects of philosophy and science, as well as it has served us, has produced a world made of myriad parts. Unfortunately, the chasm between science and philosophy, and along with it the world, has persisted to this day. Subsequently, the lack of ontological alternatives has misled all of us into believing these so-called parts are real. In some cases this belief leads to a assumption that these parts are all that is real. Not.

Contrarily, modern science, particularly quantum physics, has shown us that the universe cannot be described faithfully in terms of parts, it is better viewed as a whole in which the so-called parts are actually interrelationships woven into a seamless web in which their distinctions as parts ultimately fades into background. What matters is what they do.

Interestingly, contrary to popular thought, and not at all like the infinite entities of classical science, the principles of relationships are not that numerous. The elementary families of relationships at the elementary physical level, the forces of nature, number only four. Three of the four have been unified into one (SEW) and that remains yet to be unified with gravity. Do we know what the general form of their unification will be?

GERARD t'HOOFT writes *"A long standing ambition of physicists is to construct a single master theory that would incorporate all the known forces. One imagines that such a theory would reveal some deep connection between the various forces while accounting for their apparent diversity. Such a unification has not been attained, but in recent years some progress may have been made...What may ultimately prove more important, all four forces are now described by means of theories that have the same general form. Thus if physicists have yet to find a single key that fits all the known locks, at least all the needed keys can be cut from the same blank."* [13]

Life is a novel that has no end, and science is like reading the novel. The story you just read is merely an introduction to a change of thought, and what lies beyond is a new beginning we will experience. We leave you with a question. What does this "Blank" key look like to you? And what should ours look like? Like snapping your fingers together, and something new happens. Nature has a way of singing this song.

Some call it music.

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