

# **Introduction to the E-Book**

(revised Dec., 2010)

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## **I**

This book is a collection of essays on various related topics in science, cosmology, metaphysics, General Systems (or fractals), and "natural philosophy", which I have written over a period of 30+ years (since 1980), and have posted on my webpage beginning in about 1996. While the diversity of topics is large, they have a common motivation: a personal exploration of the nature of reality and a search for a conceptual (non-mathematical) formulation or understanding of Einstein's dream, the Unified Field Theory.

While these essays are in the category of conjecture, hypothesis, or speculation, they are not fiction or fantasy. They have been carefully thought out over a considerable period of time, and as they represent my life's creative work, I intend them to be taken seriously - not as "received truth" certainly, but as arguments of weight and substance worthy of any reader's time and consideration.

Einstein, the scientific hero of my youth, died on 18 april 1955 (age 76), a few weeks before I graduated from high school, his famous quest for the Unified Field Theory unfulfilled. I always wanted to carry on his work, but in spite of an abiding interest in physics and the natural world, I found I really had no aptitude for mathematics. People who love nature but not math generally end up (if they go into science at all) in the Biological or Earth Sciences, or perhaps Paleontology, where math phobia is not usually a career-killer. In my case I got a BS in General Agriculture (= Biology) at Cornell University, and after graduation continued working at the University for 25 years as technical support staff in three Departments: Entomology, Ecology and Systematics, and finally Ornamental Horticulture. I never got an advanced degree, but I became thoroughly familiar with the methods of modern science because I worked so many years for, with, and beside the "best and the brightest" in the Life Sciences at Cornell.

I never lost my interest in physics, but I came to realize that my true love was not restricted to either physics or biology, but was quite simply Nature herself in all her manifestations. When I turned 40 I decided it was time to get serious about my old interest in the Unified Field Theory, if only to understand it conceptually and work it out for my own satisfaction. I hadn't forgotten about my high school dream and because of my academic employment I was surrounded by smart/educated people of all ages, and had access to every kind of intellectual stimulation, book, discussion, lecture, etc., so helpful to nourishing the life of the mind. During my Cornell years I lived in the country on a beautiful old (former) farm of 70 acres where my wife Esther and I raised three wonderful sons. So in many ways I had the best of both worlds - the peace, quiet, and beauty of home and family in the country, and the intellectual stimulation of life at a great university to which I was nevertheless only lightly attached - I was not a professor or teacher, so I maintained my intellectual freedom. I did not take my work home with me (I usually took beer home with me), and I kept my mind free to think about and explore whatever topic interested me, without having to consider its implications for my career.

I have been especially privileged and lucky in this regard, having been in a good situation most of my life, usually of sound body and mind, of adequate means, and in a naturally beautiful as well as intellectually stimulating environment, both in childhood and during my adult career. These essays have to be regarded as in some sense the natural fruit of this favorable soil, as well as a personal attempt to repay my debt to society and my family for the happy circumstances of my life.

After my 40th birthday, I began more soberly (and perhaps with some guilt and regret) to consider my life's course: perhaps I had been too rebellious; perhaps I should have followed my father's example, chosen a profession, and made my mark in society? I was surrounded by professors and graduate students who were fulfilling their dreams, and perhaps also their parent's dreams for them, whereas I demonstrably (as a mere

research technician) was doing neither. The freedom of my position was wonderful, but in this life there is always a price to pay for everything. In any case, if I was going to make any progress toward fulfilling my high school dreams, it was clear that I could waste no more of the clock. I had sown a lot of wild oats and it was time to "clean up my act".

I began to read Einstein's books, and all the popular books on physics I could find. I couldn't understand the math, but I could usually understand the explanations. I found I could understand Einstein's own writing better than the authors who wrote about him (Einstein makes a real effort in his books to explain his physics in simple language).

From the beginning of my quest, I had two definite objectives in mind: 1) to understand the special role of light and "velocity  $c$ " in physics and Einstein's work; 2) to develop a 4x3 conceptual model of the Unified Field Theory in the form of a "matrix" or table. After several years of reading with these goals in mind, in 1980-81 I rather suddenly began writing papers (essays) on these and other subjects in both physics and metaphysics and have never looked back. It was very much as if the "faucet" of my creative life had been turned on.

Although some of the essays in this book date from this early period, they have undergone many revisions since they were first produced. My usual style is to write down an idea or rough out a paper in one short session (2-4 hours), and then revise and rework it extensively for weeks, months, and even years afterward. I think this is because I do not fully understand most of my ideas when I first encounter them, certainly not all their connections and implications. I think this is especially true in my case because I typically think in very general rather than specific terms. The computer word-processor (and internet website) is simply heaven-sent for the purpose of manuscript revision and personal, instantaneous publishing. We are all children of our times, but I occasionally entertain the fantasy that the internet was made just for me: how could I have published without it?

This book is therefore the record of a creative burst which occurred in my life and mind shortly after my 40th birthday and continues (certainly now at less than full flood), to the present day (I turned 73 in July 2010). It is also an attempt to formulate a Unified Field Theory, in a conceptual (non-mathematical) format.

What is unusual and unique (and hence potentially valuable) about these essays is that while (I hope) they are well-informed, they represent a highly personal and original perspective and formulation of certain fundamental physical and metaphysical concepts, including entropy, time, gravitation, evolution, human purpose, and the meaning of life. These ideas are in some sense as much art as they are science, and are perhaps best categorized as a variety of "Natural Philosophy". This is not to say they are not "scientifically" factual in the sense of reason and rationality; I take great pains to found these concepts in natural law, principle, and widely accepted, up-to-date scientific fact as thoroughly as I know how. While my ideas are new and may sometimes conflict with those of the scientific (or religious) "establishment" (and let us hope they do, for otherwise this salt has lost its savor), my facts are the same as theirs; it is only my personal interpretation, perspective, and especially my synthesis of these facts that tends to differ, in some cases, from the "establishment" view. These are ideas which have escaped the censor of peer review, government granting agencies, or even the oversight of a major professor. They are like horses who have gotten over the fence and decided they prefer to live in the wild.

Because I don't do math, don't have a Ph.D., and don't have an editor, the reader might seem to have none of the usual assurances that the ideas presented herein are valid. Well, if the reader wants to be assured beforehand that everything he reads is absolutely correct (at least in the view of the "establishment"), he should read a textbook. However, if the reader is willing to rely on his own common sense, rationality, intuition, and good judgment, he could risk learning something new in these essays. I ask no more of the reader than we commonly ask of any member of a jury.

Exactly because I do not "do math", I have had to "do English" instead, and work directly from the conservation laws (it should be understood that mathematics as used in physics is in essence an abstract, shorthand version of the conservation laws). It is my expectation and hope, therefore, that the average reader who is not versed in mathematics should be able to understand the arguments of the papers, as these are presented in terms of the conservation laws. The disadvantage of this technique is that arguments based on broad general principles, while perfectly sound, do not allow precise dissections and solutions. Therefore, while we can gain a broad and hopefully satisfying overview of the conceptual terrain of a Unified Field Theory, as of a landscape seen from a great height, we will not be able to discover its intimate details without the instrument and resolving power of mathematics. But an overview is better than no view at all, which is what we have now, and even if we had the math, how many of us could understand it? We would still have to seek the English translation. All these papers, and many more (some too speculative to risk putting into even this book), may be seen on my webpage at: <http://www.johnagowan.org/index.html>

If science is indeed providing us with a new cosmology and "world view", as it seems to be, it is especially important that ordinary people be given a fighting chance to understand it; it is important that the cosmology be "of the people", and not restricted to an elite priesthood, whether religious or scientific. Finally, science needs to be reconciled with our older, intuitive cosmologies, religions, mythologies, philosophies, and occult beliefs, such that the relation and relevance of science to the common human condition and experience is clearly understood and embraced. We feel a General Systems approach to knowledge is especially suitable to this social and educational goal.

## II

Regarding my search for the meaning of the electromagnetic constant  $c$ , my reading soon brought me to the realization that "velocity  $c$ " was not properly conceived as a velocity at all, but should be thought of instead as the "gauge" or regulator of the "non-local" symmetric energy state of light and its spacetime metric (suppressing time), and that in addition the intrinsic motion of light was the primordial entropy drive of free energy and its conservation domain, space - expanding and cooling space and so reducing the capacity of the Cosmos for work. I then realized that the intrinsic motion of time played an analogous entropy role for bound energy: both the intrinsic motions of light and time are the entropy drives of their respective energy forms, creating dimensional entropy/conservation domains where energy can be simultaneously transformed, used, and conserved: space for light, history for matter's causal information field, historic spacetime for the combination of light and matter. When I discovered "Noether's Theorem", which states that the symmetry of light or free energy must be conserved no less than its raw energy, I knew I had found a key conservation law explaining much of the role of velocity  $c$  in Einstein's work, allowing me to make the connection between light, space, time, matter, and gravitation.

There are 4 very general [conservation laws and principles](#) which are at the base of all physics, and therefore form the cornerstones of the [Unified Field Theory](#): 1) The Conservation of Energy (1st law of thermodynamics); 2) Entropy (2nd law of thermodynamics); 3) The Conservation of Symmetry (Noether's Theorem); 4) Causality (law of cause and effect ("karma")). Of these 4, Entropy and the Conservation of Symmetry, while perhaps commonly known, are not commonly well understood, although they are both simple enough in their essence. We must understand the general meaning of these 4 laws if we are to understand physics and the Unified Field Theory, for in their seamless interaction they control everything.

These ideas are further developed in the essays which follow, and they succeed in (conceptually) unifying gravitation with the other forces, mainly through Noether's Theorem and the conservation principles of entropy and symmetry: *the charges of matter are the symmetry debts of light*. All forces, including gravitation, originate as charges which represent various broken symmetries of light, conserved in a temporal form. Charge conservation = symmetry conservation; charge invariance is therefore a crucial corollary.

My second goal was to create a [4x3 conceptual model](#) (in the form of a [grid, table, or matrix](#)) for the Unified Field Theory. This model would serve as a sort of "mandala" of physical law or energy forms which could be conveniently held in the mind and thought about or meditated upon during the day. Simplicity of form is the essential requisite for such a mandala. I already knew what the 4 elements of the top, horizontal, or "header" row of the matrix had to be: the four forces of physics. The question was what were the three (or four) vertical components below this "header" row which would produce a grid of 12 (or 16) cells to complete the conceptual mandala of the interactive components of the unified theory? Clearly, at least a "trinity" of energy states was called for, and I eventually settled upon "free energy" (light), "bound energy" (matter), and "charge". At the insistence of Gus, a 4th row was added later, "force", which simply repeats the header row of the matrix, but is essential to show the system resolving itself or completing its action, and fills out the typical "4-square" form of a matrix. The logic of the vertical series of energy states is simple: during the "Big Bang", free energy (light) creates bound energy (matter), due to symmetry-breaking followed by raw energy conservation. Matter carries charges due to symmetry conservation; these charges create forces that act to return the asymmetric material system to its original symmetric state of free energy (in obedience to Noether's Theorem). *The charges of matter are the symmetry debts of light.* How this symmetry-breaking, symmetry-conservation, and symmetry-restoration occurs in each of the four force columns is the story of the Unified Field Theory in its interactive relationships.

The model building phase of the work (in which I was greatly assisted by my colleague and coauthor (August T. ("Gus") Jaccaci) progressed through several stages, the first a [grid, matrix, or "rational" form](#), the second a diagrammatic or "intuitive" form ([the "Hourglass" Diagrams](#)), and the third a geometric form which combines the rational and intuitive representations, the "[Tetrahedron Model](#)", a model of the interaction of the four essential conservation laws which underlie the action of the 4 forces. The "[Tetrahedron Model](#)" is the final, highest, most general, and most powerful form of the "unified field mandala". It does not specifically address the four forces, but the conservation laws which underlie and regulate them, and from which they arise.

Where did I get the original idea to produce a 4x3 "mandala" for physics and the Unified Field Theory? From a variety of sources, including religious, occult, and intuitive "world systems" which are rife with threes, fours, triangles, squares, and their combinations; from General Systems and Cybernetics theory, both of which were "in the air" at the time ("input, thruput, output"); and from "scientific" or rational physical forms, such as the structure of spacetime, the four forces of physics, the periodic table of the elements, the 4x4 matrix tables of Heisenberg's quantum mechanics, Einstein's 4x4 tensor matrix of spacetime, the 3 quarks and 4 charges of the proton, etc. All these sources and many more (as may be seen in the table "[The Fractal Organization of Nature](#)") strongly suggest there is a simple 4x3 metric which is the fundamental organizational structural element or fractal algorithm, the "crystal seed", germ, or fundamental note of resonant energetic structure and natural law regulating cosmic evolution. The 4x3 metric or algorithm comprises the "simplest sufficient complexity" to create and sustain the Universe. This simple metric is expressed in terms of the dimensions of spacetime, the structure of free and bound energy forms, and the forces, conservation laws and principles which characterize and govern spacetime, light, and matter. (These General Systems models are rather similar to the "chaos" models which were independently developed around this time. See James Gleick's book, cited below.)

### III

The final ingredient of this story involves not a literature search, creative state of mind, or life stage crisis centered upon my 40th birthday, but an external intervention which also occurred at this time at the initiative of my father, who in 1980 invited me to accompany him to the annual meeting of "CPSI", the [Creative Problem Solving Institute](#), which in those days met on the campus of SUNY Buffalo in upstate New York not far from Ithaca and Cornell. These meetings were instrumental in my creative development, for they gave me an outlet for my thought and writing, and through them I met Gus, a kindred spirit who not only

believed in my work but had himself (with George Land) developed a 4-part [General System model](#) of the dynamics of natural (biological) growth.

I attended CPSI with my father every year (in mid-June) from 1980 until his death in 1986. My father's passing produced a 4-year hiatus in my CPSI attendance, but I returned at Gus' behest throughout the decade of the 90's. CPSI gave me a place to present my papers and provided colleagues who encouraged me and even collaborated; without this stimulus I doubt my creativity could have been sustained. In 1996 I began to put my papers on the internet, and the importance of CPSI in my creative life declined as the importance of the internet grew. Now I am satisfied to write exclusively for my web page, and also for this e-book. But I view the intervention of my father, Gus, CPSI, and finally the internet as the analog of a magical act of external influence which always seems necessary (in both life and mythology) for mere mortals to achieve their dreams or accomplish the quite unreasonable goals they sometimes set for themselves. Once again I have been blessed in the course of my life, and once again I must view these essays as the fruit and happy consequence of that blessing.

### **Links and References:**

James Gleick, 1987. Chaos: Making a New Science. Viking Penguin, Inc.

[Chronology of the papers and ideas](#)

[Grand Unification - The E-Book](#)

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