

20.06.2013

IT FROM BIT OR BIT FROM IT

The key to this essay is IT AND BIT

EXPLANATORY ORIENTATION

Bits are the bipolar symbols of the digital code, the most systemic language yet invented by mankind. This code signifies evolution at its most basic: One-on-nought opposition generating the potential of patterns of IT-system programming. -How can symbolic mutual exclusiveness lead to evolving patterns of complexity? – Nought and one by themselves are just symbols. In systematic combinations their difference makes the difference of a universal machine code. The vital ingredient is human ingenuity.

All languages are systemic in the sense that they standardize the diversities of thought symbolically to either oral or written communication in terms of ranges of commonly understood denominators or words. Mankind is adapted to learning and using such systems for designing, processing, memory and recall of information. Hayek, enlarging on Adam Smith, explained the market society as the most informative social order yet evolved by humanity. It draws out the latent informations, dispersed in every person. This was before the internet engulfed humanity.

Human thinking in turn deals with what we can glean as physical perceptions of the environment. We have been learning that our environment is infinitely more varied and complex than present human capacities to absorb more than what we are looking for. Our vocabulary is grounded in the common perceptions of our environment. In evolutionary terms it satisfies the human survival needs-to-know.

We humans as individuals are also finding ourselves far more complex than we can grasp consciously. What we felt and experienced somehow emergently all along from all the way back of our evolution is now being spelled out in ranges of intra-human relations, connections, biases, fallibilities and ailments by ever more scientific research and findings.

Popper described science as “common sense writ large” and therefore more eligible to investigate and question than common discourse. Science, physics in particular, has been always focused on time-less laws and systemic regularities of the environment, as it was interpreted. Physics grew historically from astrology to the inter-actions of solid bodies, to fluids, gases and radiation, progressing from the most visible to most invisible phenomena.

Physics evolved widening horizons from the largest to the smallest visible, to invisible, even hypothetical objects in our vocabulary. It opened micro –worlds of oppositional force-charged particles/waves and the realisation that this sub-atomic world may explain itself and the whole world as subatomic interactions of balancing oppositely charged energies/forces. Inevitably nuclear energy is now everybody’s concern and the main current test of human survival.

PROBLEMS AND SOLUTIONS

So what can be a deep or ultimate understanding of the nature of reality in the current terminology of the English language? – Work-in-progress, like our evolution. This is implied by the authors cited

next. Physicists like Schroedinger, Weizsaecker, Hawking, Penrose, Gell-Mann, Feynman, Rees, Deutsch, Smolin and others of this growing genre are having their say. The most trenchant outsider commentator since 1935 was and still remains the late Karl Popper.

David Deutsch with "The Fabric of Reality" (1997) and "The Beginning of Infinity" (2011) sets the tone. He explains: "I have been advocating a particular world-view based on the four strands: the quantum physics of the multiverse, Popperian epistemology, the Darwin-Dawkins theory of evolution and a strengthened version of Turing's theory of universal computation." In his view this is the conservative view that "ought to be the prevailing view, the one against which proposed innovations are judged."

This conservative interpretation is already challenged by Lee Smolin with "Time Reborn: From the Crisis in Physics to the future of the Universe" (2013). Smolin asserts the reality of time by widening physical theory from the essentially timeless mathematics to an evolutionary approach. All this does not affect the proven physical laws, which are based on unique unchanging conditions. A single atom is physically definable as either and both a particle and wave. Atoms in great numbers and complex orders, like humans, are out of control of classical physics. Their coordinated behaviour is energetic, wide ranging and highly unpredictable.

Difficulties of explaining, implicit for all the authors mentioned, and the rising crescendo of publications are signs of growing activity and generativity. Language of one kind or another is the medium of such intensifying engagements. However much energies are engaged, language is the medium and according to McLuhan the medium is also the message.

One of the tenets of the Popperian epistemology is that science is explanatory. Science cannot foretell the future. Deutsch explains "The Beginning of Infinity" as follows: "In this book I argue that all progress, both theoretical and practical, has resulted from a single human activity: the quest of what I call good explanations. Though this quest is uniquely human, its effectiveness is also a fundamental fact about reality at the most impersonal, cosmic level - namely that it conforms to universal laws of nature that are indeed good explanations. This simple relationship between the cosmic and the human is a hint of a central role of *people* in the cosmic scheme of things."

An ultimate good explanation available to us now can be Evolution. It has the widest explanatory reach. Popper termed it a metaphysical theory on the grounds that it cannot be falsified. As evolution has evolved all life, all life is of an evolutionary nature on test to solve the problems of its survival. Deutsch and many others describe how evolving life on planet earth had to do it the hard way in inhospitable environments. Acquiring the necessary survival fitness to evolve further, whatever it may cost, is fundamental to our evolution.

We currently living humans are the successors of countless generations of parents leading to us. We are also by all accounts so far the most numerous, most healthy, long-living and most socially and technically advanced human generation in history. All the signs are that our children, the next generation, can do even better. What is the problem? - As Popper anticipated, it is the evolution of problems. Solving problem means spawning new problems.

If problem solving is our fate, Deutsch along with Popper, argues that understanding our infinite ignorance, related to our finite knowledge, is the source and challenge of the beginning of infinity.

Humanity now, as always, is on the threshold of the continuing quest for questions and explanations, leading to more emergent orientation and exploration.

The key is: understanding our knowledge in relation to our ignorance and our ignorance in relation to our knowledge. Ignorance, as a word, sounds factual. Ignorance relating to knowledge becomes the missing ranges of what we can look for. Similarly infinity is not nothing, but so far unimaginable potential.

RELATIONSHIPS AND SYSTEM

If conceiving a knowledge-Ignorance relationship is revealing, a relationship - system distinction is necessary for a clearer understanding of the dynamics of our existence. Relationships are live. Systems are constructs. Both words are often used interchangeably simply because all systems are human constructs. The indispensable human originators and users tend to be implied and taken for granted in the short-cuts of discourse and operations.

Science and technology operate systematically with systemic explanations. The whole discourse is impersonal, intentionally objective. Add to this the sequential systemic order of language and vocabulary there is little explicit scope for the relationship factor, without which nothing would have happened in the first place. Relationship, excluded as a complicating factor, eliminates the engagement. Much the same is true of the left brain-right brain hypothesis based and argued almost entirely on left-brain terms. What can be said about the so-called right half- brain and creativity is that we are still ignorant, that it is largely inaccessible to current scientific research and that it is really essential for life. It may even point to an approach to the energies of life itself.

In contrasting relationships with systems we can understand their differences and at the same time discern how they are necessarily competing in the real world. Relationships as constructive-destructive force and systems as operative results create the means for further initiatives, great hierarchies of expanding systems in our days. This is in the nature of Popper's solution quest of problem-solving dynamic s. We can learn from contrasting the left half against the right half of the brain. We can learn more by exploring it as an ignorance problem engaging our range of finite knowledge. Our brains together are the evolving organic creators and guardians of us as persons and our human civilisation. Their relationship may give us clues of the nature of evolution.

Human relationships are the motivators and ultimate problem and opportunity generators of humanity and every individual human being. Taken together our challenging, volatile relationships, potentially creative and destructive, are innate to life itself and to evolution the way it happens. Idolizing and demonizing are the extreme manifestations marking the range of our social dynamics.

VARIATIONS AND RANGES

Evolution can be outlined as evolving more of everything, including itself, as far as it goes and more variety as it arises. There is no evidence that evolution has foresight. Quite persuasive cases for evolutionary destiny have been made out by religious faiths, particularly also by Pierre Teilhard de Chardin (1959). What Schroedinger wanted to call negentropy versus entropy, was his attempt to explain evolution in physics terms as bi-polar forces of growth and degeneration. Others postulate a distinct life force. This is not just a problem of terminology but also one of explanatory reach. A

minimal current consensus could be that evolution appears to be an emergent energizing force of creating with selective implications.

Science and the Bible appear to be in coincidental agreement about a 'Big Bang', so far unexplainable beginning /creation. The American physicist Gerald Schroeder has demonstrated in "Genesis and the Big Bang" (1990), that the Biblical six days of creation translate well into six similar evolutionary phases on the cosmic time scale, as measured by the Einstein radiation time scale evolution. Thus the 8 billion years of the Biblical day one would scale down to about 250 000 years for the Biblical day 6 representing the current phase.

Life somehow evolved through sub-microscopic single cells to conscious human beings by unceasing energetic trial-and-error evolution. Error or negative selection, however destructive it comes, is making room for further evolution. The theoretical biologist Bertalanffy is quoted, asserting that only multi-cellular life brought death into play as an evolutionary program. Nervous systems added pain and with consciousness fear. Possessions induced worry. All such pain comes with equally evolving opposites like new-born life, joy, hope and fulfilment. Taken together, these ranges help to specify emotional evolving human consciousness.

In the overall evolution of evolution in the latest 3.5 million years, life can be singled out as the most dynamic aspect and the human evolution as the most accelerating part of the evolution of life. Conscious and complex, as we are, we would not be what we became, if we were not also evolving mammals, molecules and cells, contending with all forms of life. According to physics we are all atoms, which we share with the rest of the universe. All the forms of life, humans have transcended, have continued to evolve in their own slower ways. We could not live without them. Physically humans conform among themselves. What makes the difference from person to person is physically elusive, emergent, relational and evolutionary.

All this is borne out by what we learn of evolution. Emergent variety always evolves as part of well-tried repetition. We are a half and half DNA mix from our parents. Inbreeding is self-eliminating. Genius is tempting fate. Much has been made of an apparent backlog in our brain adaptation to our growing evolutionary pace. This may not be a good explanation. All the signs are that the perceived accelerating change is progressively human brain driven. In a widening context within widening horizons the pace of human evolution and domination has already led to the emergent problems of our living environment, climate change and economic sustainability. How can we rely on and cope with the problems of unceasing evolutionary expansions, of which we are collectively the key driving force?

MEDIA AND MESSAGES

Language, as spoken and written, has been singled out as one of the most significant human evolutionary attainments and promoters. Marshall McLuhan wrote in the Sixties about the evolutionary inter-connectedness of medium and message in communication. All the science writers, I am quoting, faced the problem of fashioning into good English, what they know and think about physics and the world. All of them were successful in terms of getting attention. Most of them refer to the problems of expressing their thoughts. Collectively their implicit competition evolves in the nature of comparable spreading potentials of explanations.

English is now the most used and connected communication medium, evolving from a typical evolutionary origin, a mid-Asian dialect that caught on. Overwhelming usage of English should reflect overall distribution and trends of topics communicated. A recent survey of Wikipedia has indicated that relational topics were 45% and systemic topics 55% of the total of topics recorded between 2006 and 2008. More than 100% additional topics of both kinds were added during this period.

This in turn is in line with the evolutionary characteristics of higher volume and increasing variety promoting more evolution. How does selection cope with such onrush? - All forms of new information are met and saved these days systemically through information technology with accessible electronic storage through competing search engines.

A 'consumer society' has already resulted from an undreamed-of evolution of supplies and varieties of consumer goods. Now we are also on the way to an information society through comparable means of information generation and availability. The consumer society is evolving into a consumer information society. IT-systems restructure and widen system applicability.

The evolutionary trend from physical to electronic operations upstages normally spoken and written language use. This is amplifying a common characteristic of all systems and rules. They reduce the need of inter-personal communication (arguing) as long as the systems function and rules are followed. The Swiss have less to shout about than the Africans.

The outcomes of these evolutionary trends are speedier and potentially widening selection facilities, available to everybody. In practice this means that nobody can know all the possible options, but all can select their own relevant range of options to express themselves. It is the possible prospect of infinite evolutionary variety and selection, balanced and stabilised by ongoing selection by all alive.

In practice all kinds of relational tangles are likely to channel such promise of infinite freedom of choice and turn it into more accustomed structures and struggles, characteristic of our evolutionary past. Competition for ownership, gains and safety engenders restricting regulatory needs of order and security on technical, managerial and political grounds.

Evolutionary survival fitness has to be practiced and tested to develop. This applies at all levels, particularly the grand systems conglomerations of the internet and IT-systems. If they become monopolies they will be toppled. If they make themselves indispensable they will be systemized. Size and power attract opposition. These are the unbiasing selection influences of evolution for the sake of evolving overall evolution. Indirectly they are reflected in our struggles with honesty, convictions and sincerity.

Advanced languages have developed a systemic bias along with the science-technology success story of the last 200 years. Set against masses of systemic, definable nouns, verbs are a less variegated and specifying minority. Our perception is largely vision-based. We tend to imagine pictorially. Our movie stories are successions of pictures which we perceive as movements. We have to communicate movement in terms of stories. Our current information society evolution is more visual-pictorial than textual-verbal productive. Proverbially a picture is like a thousand words. Pictures are more direct relational communication. However competitive this engagement may turn out to be, pictures and language engage like the two halves of our brains.

We have also speeded up from messengers to daily newspapers to instant radio and television. With a click on the net we can become inter-active. We can scan the whole world on our screens without going outside. Alternatively we can go to almost anywhere in the world within a day or two. Whilst language transmission has evolved in line with the technologies, language itself has remained systemic static or comparative static.

The difficulties of rendering dynamics in science writing are further aggravated by the sequential cause and effect implications of common, impersonal static or comparative static mathematics and writing. In this essay I am trying to show that dynamic enlightenment can be infused by contrasting and comparing key terms with opposites, for example ignorance versus knowledge and relationships versus systems. Such approach reflects the bi-polar creating-selecting nature of evolution.

The comparable degrees of more or less in the range of the of th extremes allow for ranges of comparable realistic options with no reductive deterministic implications. Such approach reflects the overall evolutionary dynamics of growing creativity versus dynamic selectivity.

In physics everything is basically bi-polar energy. Range analysis can reflect the opposing energies with the organisational potential. Mutual engagement is initiating between them interactively specific further evolution. Current technology organisational leaders like Amazon, Apple, Face Book, Google, Intel, and Microsoft, are mostly USA based with generally Far-East manufactured hardware. This is the most spectacular current aspect of an intense, competitively charged widening range of technical evolution, arousing the whole world to come to terms and to live with the implications. All this is challenging but infinitely preferable to selection by atomic warfare.

LEARNING TO EVOLVE THE HARD WAY

After we were born we all struggled for balance for the first year or two. We were obsessed by it, even though we did not know what we were up to until we had done it. Virtually all of us succeeded sooner or later. We had the potential and urge. We were guided by our parental and sibling environment. As soon as we could we were running around grabbing everything we could reach. So far this can stand for normal initial physical development from birth. Physical balancing, like breathing, though absolutely vital, becomes then subconscious. Later when we learn to ride a bike or even later when we try tight-rope walking we have to learn more systematic balancing essentially by disciplined 'trial and error' training. Such 'specialist' sustaining practice is needed to ensure continuing high-level performance fitness. It becomes character defining.

Learning communication is a concurrent but brainier practice problem for the child. It requires social contact and lifelong serious practice. Bodily integration of communicating evolves into playing. Playing and playfulness have been recognized as vital in human evolution. Playfulness is at the root of art, sport and even scientific experimenting and exploration.

Competitive sport since the nineteenth century is a telling example. Sport reflects systemic evolution of play into institutions of sport. Sport dynamics are highly competitive and also highly cooperative with great visual accessibility. Visibility and popularity is enhanced by strict rules, fairness principles and ruthless outcomes. Outcomes are always measurable and uncertain. Sport evolution has also seen to endless diversifications of sports and formal competitions in every walk of life.

The outward simplicity of sport, as of evolution, also displays more clearly the consequences and side effects of such a typical influence in the human context. The disproportionate attraction of human and material resources to sport is obvious. The stadiums become the sports cathedrals. Profiteering and cheating become part of the game, countered by intrusive security and obsessive controlling bodies. With growing institutional weight sport is becoming less organic with all the hangers on. The sheer numbers of different aspects obscure focus and overview. Individual sports corner the limelight or share obscurity. It all becomes conventional. Extreme advertising and star cults raise the stakes. Winning is all. The rest are losers, lost in need of supporters.

This childhood and sport based account reflects basic evolutionary dynamics in general. This is not a straight effort= result causal story. Scientifically it is usually represented by the elongated 'S' curve relating invested effort to results over time, which is typical in varied ranges for all kinds of enterprise. It never can be the whole story. Like all evolutionary dynamic, it evolves in bipolar ways: The greater the range and mobility, the greater the dependence on solid foundations.

Physical science has evolved from astrology to expanding cosmic observatories in Palo Alto, Hawaii, Chile, South-Africa and Australia to particle colliders and mega-microscopes in Switzerland and more to come. It also relies on technical off-springs, such as space travel and micro-technology for its insatiable needs for further observations. No other science has managed to realise a similar spectacular array of evolving physical support. A spin-off in the last twenty years was the internet, thanks to Tim Berners-Lee in particular. No other science has wider horizons than physics.

Medical science by contrast has evolved from the intimate needs of practical person to person live support. In the nature of its calling medicine is grounded in common experience, largely taken for granted. According to Doctor Jonathan Miller (1978), the relational complexities of the medical problem did not become effectively treatable until the middle of the twentieth century. "This has been achieved by the accurate identification of the sort of thing our body is. And since finding out what something is is largely a matter of discovering what it is like, the most impressive contribution to the growth of intelligibility has been made by the application of suggestive metaphors."

Since then suggestive medical metaphors have been progressively translated into techniques of scanning, visualising and curing inside human bodies remotely, without cutting them open. Medical services are evolving technically and impersonally. We can live safer and longer. Patients become categorized cases. This is part of the evolution of evolving social conventions. From self-service shopping to internet surfing systemic orientation is the pre-dominating contact requirement. Pressing the right button rather than socializing becomes the rule within the bounds of the evolving systems.

Widening horizons open the view to greater unpredictability, uncertainty and insecurity in a society ever more concerned about its proliferating potentials and possessions, as Bertalanffy suggested. These days we can see and record so much more of things going wrong all the time, ranging from quakes and pandemics to wars and financial disasters anywhere in the world. A proliferating insurance industry is systematically compensating for accidents on the basis of pre-set causality models. Much more important are the opportunities of what can be learned from mishaps to improve the run of outcomes in the future.

THE EVOLUTIONARY COMMUNICABILITY POTENTIAL

This essay, like all essays, is technically a systematizing product, just as all communications are systematizations or generalizations of feelings and thoughts. Its success as a communication depends on rational systemic criteria. But exclusive conformity would merely confirm existing texting. It would be formal plagiarism. In the context of competing essays, interest will arise from the juxtaposition or engagement of form and content, like the initially addressed difference between bit and it, only more so. The prize is a creative marriage of form and content.

Juxtaposition reflects a rational logical/systemic mode, a comparative static opposition. Engagement implies effort, contest and uncertain outcomes. In evolutionary terms engagement means unforeseeable change for better and worse. Such change is like a one-bit of evolution. It is energetic, disruptive and unpredictable. These criteria are quite typical of nature as we explore it, ranging in human experience from sub-atomic particles to stellar relationships. They are even appropriate in contrasting the functionality of the right halves of our brains with the left halves.

Language can be interpreted as reflecting our human evolving relationship with our evolutionary existence, broadly indicating the state of our concurrent civilization. Every speaker and writer in English has a part in the English we get. Our individual influence on language evolution may vary widely but, collectively reckoned, will always be minimal. Collectively language has to approach some kind of emergent commonality of outlook and expression to serve its evolution.

This is the kind of evolving pattern identified more compactly by the human genetic make-up and the DNA. Our genetic make-up has proved indispensable over millions of years of organic evolution. It has therefore become more fine-tuned and firmly established than our communicability. Our communicability is irreversibly dependent on our genetics. Our communicability only evolves in relation with our genetics as the activating influence in the joint evolution.

I suggest that comparable dynamics also relate to the evolutionary engagement of human communicability with the ongoing evolution of evolution. Here the conserving elements are the languages of words and numbers in all their established systemic orderly complex hierarchies.

To the extent, that these languages reflect our ranges of ignorance-related knowledge, they show up the strengths and weaknesses of our human intelligence. Our greatest difficulties are shown up in expressing and differentiating energies, change as changing, action, dynamics and emergence in relation to the bulwarks of nouns. Comparative statics and the calculus were a start. The outline of an evolution related bi-polar range analysis method of this essay is put forward as a methodological advance for linguistic expression of evolutionary problem solving.

Standing on the shoulders of giants, as we all do, we also unavoidably put them in their place. Innovators are first received as disrupters. Their innovations have to pass muster. Innovations either sink or swim on impact. Evolution provides unending repetition and testing until the innovations are either taken for granted or forgotten.

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