Systematic Innovation

e-zine

Issue 139, October 2013

In this month's issue:

The Systematic Innovation e-zine is a monthly, subscription only, publication. Each month will feature articles and features aimed at advancing the state of the art in TRIZ and related problem solving methodologies.

Our guarantee to the subscriber is that the material featured in the e-zine will not be published elsewhere for a period of at least 6 months after a new issue is released.

Readers' comments and inputs are always welcome.
Send them to **darrell.mann@systematic-innovation.com**

Art, Innovation & Inventive Principles

Scholars have argued fruitlessly through the ages to define what is and is not art. It's about time someone set the record straight once and for all. And who better to do the job than us? ☺.

Okay, joking aside, a plausible justification for the world of innovation to have a crack at answering the unanswerable is that there are many similarities between the creation of a piece of art and an innovation. Art scholars will argue (for days if you let them (we've tried!)) whether art is about aesthetics or beauty or paint & canvas or originality or meaning. As with any kind of either/or argument – 'art should be beautiful; art should be ugly' – the only clear conclusion is that the question was the wrong question. Art can be and frequently is both sides of any black-versus-white argument. And in any event, no sooner has the art scholar community made what they believe to be a definitive statement, and along comes some awkward artist to break the 'rules' and prove them wrong.

Somehow, though, people seem to have an inbuilt radar that tells them whether something is art or not. Take the three candidate examples shown in Figure 1. Which of the three would you describe as 'art' do you think?

Figure 1: Which Is Art?

Well, the one on the right is Pablo Picasso's 'Les Demoiselles d'Avignon' from 1907 and everyone knows he was an artist, so that must be art. But if the picture gets used in an advertisement for, say, shampoo, does that mean it's not art anymore?

And what about Tracey Emin's 1998 work, 'Bed', the photograph on the left of the figure? Many would – and did – argue that someone's unmade bed was not art. Even though it was exhibited in the Tate gallery and last time it was sold it made close to a million dollars.

According to our (TRIZ) way of thinking, whether something is classifiable as art or not is dependent on context. At the time they were created, both 'Bed' and 'Les Demoiselles d'Avignon' were art. Les Demoiselles is not art anymore – if someone were to paint a copy of it (or an advertising billboard printed a reproduction) it would or should be called 'craft'. In the same way that the watercolour in the middle of the Figure 1 trio is craft. A million 'artists' create a million things like this every day, many of which will find themselves hung on someone's wall. But none of them is likely to be art. Why? Because, like much of Picasso's work as seen through today's eyes, it carries with it – nay, is intended to carry with it – a high degree of familiarity and usually even comfort. The sort of thing that every hotel on the planet wants to hang on their walls, to tell the weary traveler, 'don't worry, we're here to make your stay a pleasant and restful one'.

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So how can we reliably distinguish between what is art and what has become craft? We think the start of the answer lies in Figure 2, a comparison between what we think art is and what we think innovation is:

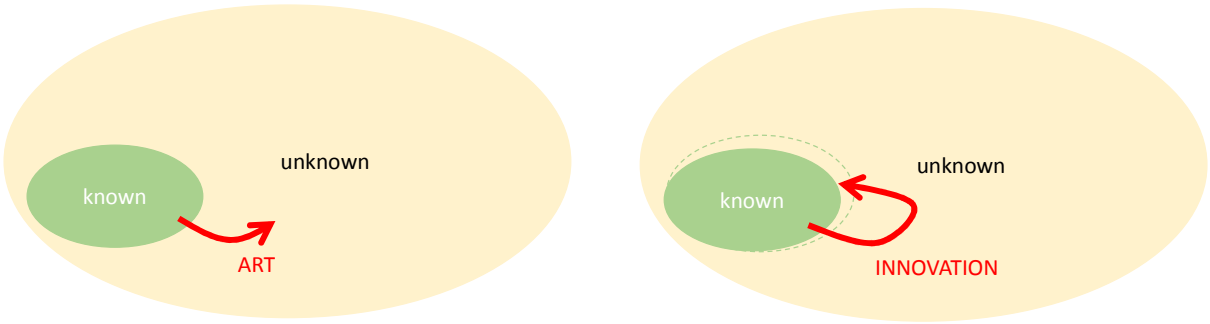


Figure 2: Art & Innovation

According to the picture, 'art', on the left, is about some kind of jump or shift in perspective from the known to the unknown. It might be a completely original way of depicting things – as was the case with Picasso's 1907 proto-Cubist work – or it could be a way of taking something completely mundane – like Emin's unmade bed – and using it in a way that forces people to see the world from a completely different, previously un-thought of, 'unknown' perspective.

Innovation – which we typically define as 'successful step-change' – is, like art, all about a jump from the known into the unknown. But, unlike most 'art', it also has to find its way back into the known in order to be successful. It might, of course, end up extending the boundaries of the known during this process, but fundamentally we all of us live in this known space and so to communicate with us, and to add value for us – whether that be tangible or intangible value – means the innovator has to connect to and fit with us and the world we live in.

Artists – real artists that is – devote their lives to exploring the unknown. The vast majority end up forgotten and penniless. The unluckiest ones – people like Vincent van Gogh, who managed to sell just one painting during his whole lifetime – are the ones that venture so far into the unknown that it's only after they die that the world catches up with what they had achieved. The lucky ones – people like Pablo Picasso and Tracey Emin – manage to venture just far enough into the unknown that they are able to be successful within their lifetime. These are the artists that live on the right hand side of Figure 2 – they're the innovators that found a new way of doing or depicting things that resonated with sufficient 'customers' willing to pay for the 'value' added.

If 98% of innovation attempts end up failing (our current statistic) in the non-art world, our guess would be that it's about the same in the art world: most attempts to venture into the unknown end in failure. The 2% that do make it tend to become visible, like any good innovation, because they create some kind of a movement or label. And then a series of imitators. A cursory look at an art history timeline can quickly reveal what the art 'innovations' have been over the centuries. Figure 3 represents such a picture.

In theory, what pictures like this help us to do is to begin reverse engineering the basis of why particular jumps occurred and were successful at a given moment in history. That would be a topic way bigger than what might be accommodated in this crude, short article. But what we can hope to achieve is some kind of a connection to contradictions and the TRIZ Inventive Principles. The idea is simple and comes in two parts: firstly, a venture into

the unknown involves some kind of a provocation, and secondly, a successful step-change almost invariably involves the identification and resolution of some form of contradiction.

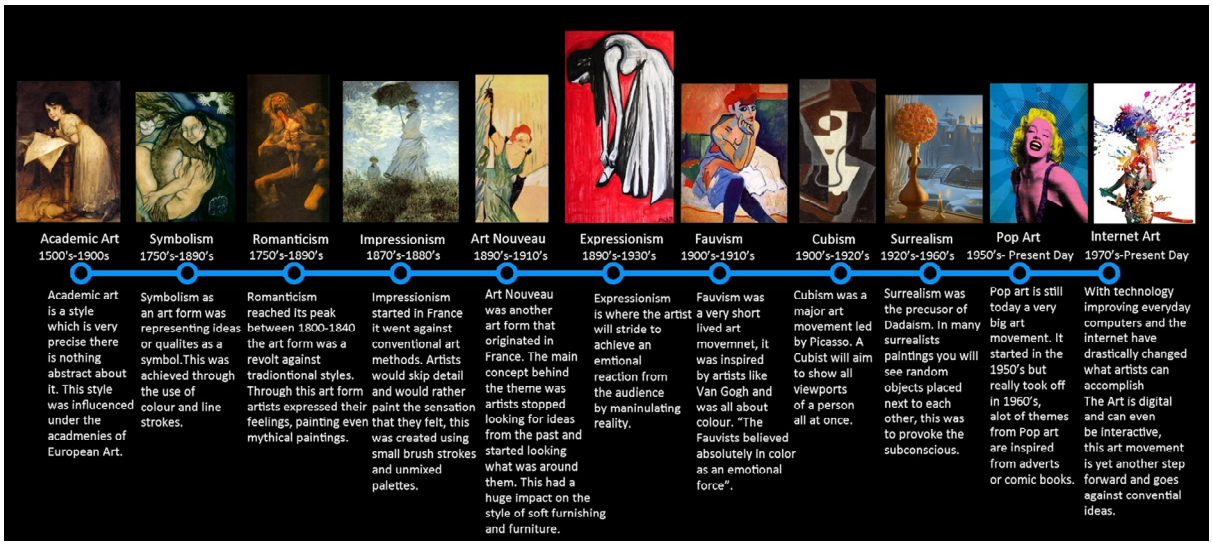


Figure 3: Art History Timeline

Almost any (real) artist – i.e. someone intent on venturing in to the unknown – whether they're going to end up being successful or not, will have made their jump into the unknown in a manner that will end up matching one or a combination of the TRIZ Inventive Principles. At least that's what we're finding. When we first started looking at this subject, as we do whenever we enter any new domain, our hope was that when we see the step-change jumps being made by artists, we might find things that didn't fit with the 40 Principles and therefore would allow us to extend the list. Five years down the line and, while we've been able see illustrations of just about all 40 of the Principles, we have not seen a jump or provocation that does not fit the established model.

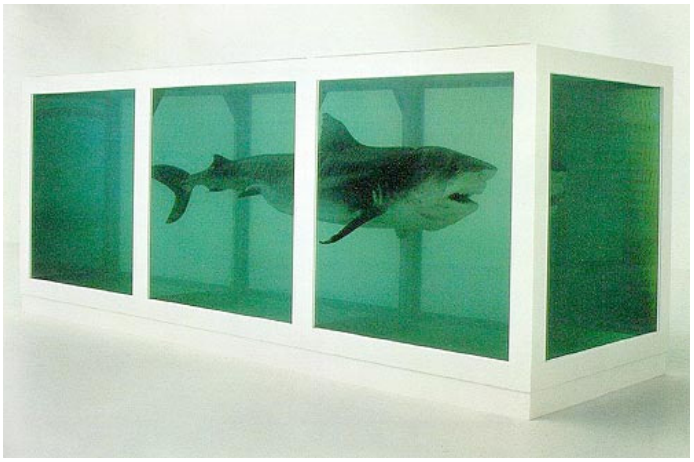
There seems, in other words, to be something universal about the 40 Principles. In art as elsewhere they are best looked at as 'provocations' to help problem solvers escape from their (known) box and to find a better (unknown) way of doing and seeing things.

Whether explicitly or not, every (real) artist could be thought of as a user of the 40 Principles. The successful ones, to pick up on the other point made a couple of paragraphs ago, are the ones that managed to identify a contradiction which their provocative leap into the unknown somehow manages to solve. Through history, it seems that the 'process', if we can legitimately call it that, has happened largely through trial and error. It might be interesting, one day, to explore how a more systematic approach to the subject of making (real) art might change things. Or maybe that's anathema to any artist worth his or her salt?

Whether it is or not, we'll leave the philosophers to debate. We'll wrap up this article with a short look at some of the artistic provocations that have stood the test of time and how they can be seen to illustrate and serve as archetypes to some of the Inventive Principles:

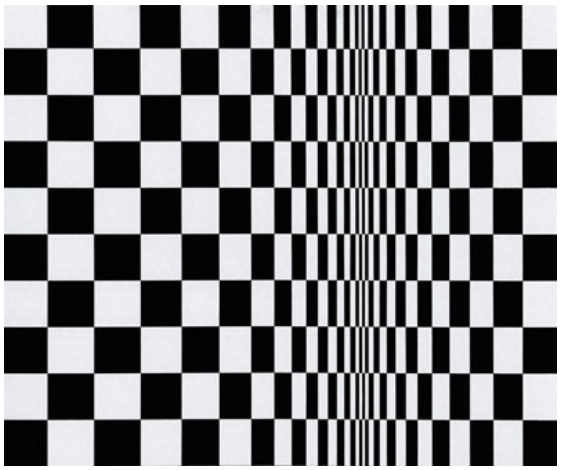
Principle 1, Segmentation - Pointillism
Principle 2, Taking Out – Impressionism, Pop Art, Abstract Expressionism, Naïve Art, Art Brut, Minimal Art
Principle 3, Local Quality – Hard Edge

Principle 4, Asymmetry - Rococo
Principle 5, Merging – Triptychs, Mark Rothko panels
Principle 7, Nested Doll – mosaic, photo-mosaic
Principle 10, Prior Action – Damien Hirst, 'The Physical Impossibility of Death in the Mind of Someone Living':



Principle 13, The Other Way Around – Tracey Emin's 'Bed', Marcel Duchamp urinal (the everyday becomes other-worldly), Banksy (graffiti as high art), Dada, Magritte:

Principle 15, Dynamics – generative art, art designed to decay over time, Body Art, Video Art, Op Art:



Principle 17, Another Dimension – Cubism, Surrealism, Abstract Illusionism, Edward Hopper, Howard Hodgkin (the frame becomes part of the picture:)

Principle 25, Self-Service – Chris Ofili (e.g. making use of elephant dung)
Principle 26, Copying – Andy Warhol

Principle 29, Fluid – Jackson Pollock 'drips'
Principle 31, Holes – Barbara Hepworth/Henry Moore abstract:

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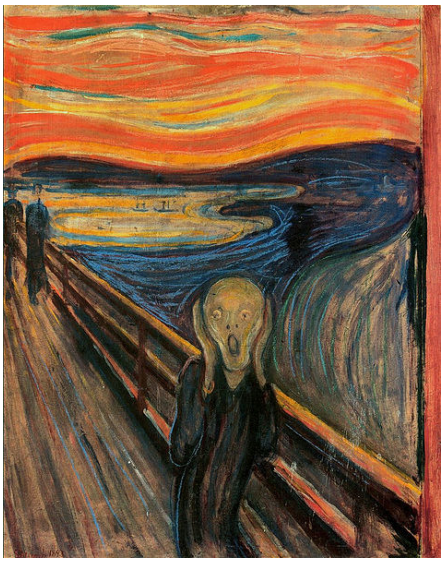
Principle 32, Colour Changes - Gauguin
Principle 33, Homogeneity – Photorealism:

Principle 35, Parameter Changes – Romanticism, Giantism, Lucien Freud, Futurism, Orphism:

Principle 38, Enriched Atmosphere – Expressionism



Hearing What Is Really Being Said:
Part 2 – Mercuryφ

Back in October of last year (ezine issue 127), we introduced the first in what was intended to be a whole series of articles about the various different tools that go together to make up the PanSensic capability. In that first article, we wrote about Thinking Styles and the importance of capturing a person's prevailing Style if we are to truly begin to understand what it is that they're thinking, as opposed to the words that might be coming out of their mouths. Another article, outside the boundaries of the e-zine, went on to talk about the capture of metaphor (JupiterMu, Reference 1). This time around, we introduce the MercuryPhi tool and its place in the overall sense-making story and what we have started to describe as a 'science of reading between the lines'.

MercuryPhi is all about measuring the underlying views that people have of one another and how those views have the potential to shape conversations. The primary inspiration behind what we might think of as an inter-personal attitude measurement tool, is the Tom Rath work on 'Vital Friends' (Reference 2). Rath's big idea was, to paraphrase a little, a recognition that when someone leaves the employ of a company, the main (unspoken) reason they leave has little or nothing to do with salary or the type of work, or working conditions, and almost everything to do with whether or not they had the right group of friends and co-workers. Or, to turn it the other way around and put it more starkly, to paraphrase another of our good friends, 'people don't leave companies, they leave a**holes'.

Any 'science of reading between the lines', we believe, has to take into account the intangible space between two people – whether it be boss and subordinate, clinician and patient, store clerk and customer, or even indirect interactions like market research survey and consumer. We need to know, in other words, what the people involved in a conversation might 'really' be thinking about themselves and the other person. Even

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looking at this space between just two people, the complexity of the interactions quickly spirals beyond just the two tangible entities:

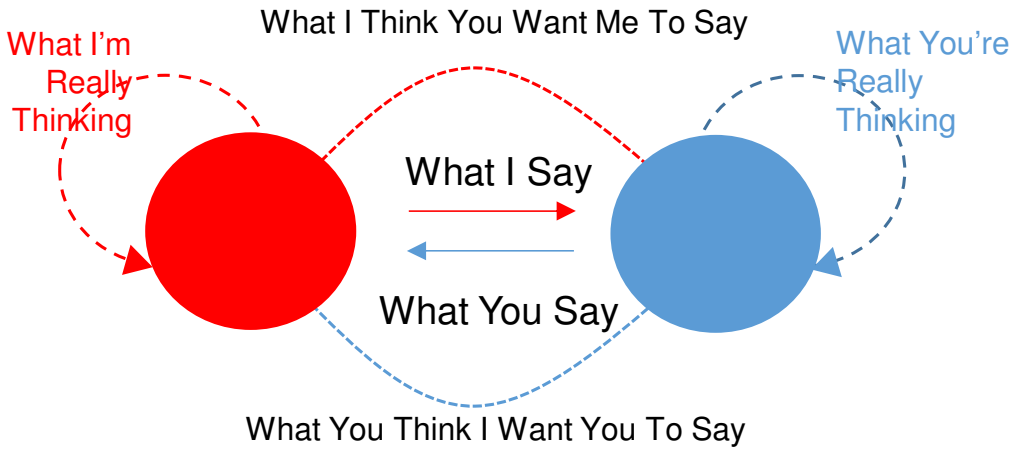


Figure 1: Mapping The Tangible & Intangible 'Between' In A Two Person Conversation

Or, to quote another frequently used aphorism: *"There are six people in every conversation: you, the person you think you are, and the person with you thinks you are. Then there's the person with you, the person they think they are, and the person you think they are."*

Out of all of this complexity emerge certain patterns of inter-personal interaction. There are, of course, many different kinds of interaction that can be observed and classified. What make's Rath's Vital Friends work so important is that it identifies a much smaller set of interaction patterns that can be seen to be the ones that play a role in defining and driving behavior. And, ultimately, that's what the PanSensic toolkit is all about measuring – behavior defines reality.

Rath identified seven 'vital' pattern types that we've incorporated into the MercuryPhi tool. They are:

Mind Openers – those people and relationships that expand your horizons and encourage new ideas; the people that know when you're in your comfort zone and need to be dragged out of it – and, moreover, know how to do it without getting your back up; the people that somehow know how to put the exact right piece of new-thinking stimulus in your inbox at just the right time.

Energisers – the fun friends who are there to give you a boost

Route Finders – trusted advisors and people who are able to help you see the big picture, tell you you're in the 'wrong jungle', help you see where you should be going and help you draw the map of how to get there, and then navigate and keep you headed in the right direction

Champions – the friends that stand up for you and what you believe in. Irrespective of whether you're right or wrong.

Uniters – the bridge builders that connect you to others; the people you socialize with and help create and maintain the links between the different nodes in a network. Uniters join the unjoined.

Rocks - the people that are always there for you; the 'go to' person whenever times are tough; the friends with similar skills and interests; the collaborator and teammate that knows what you do and how you do it and is able to step into the breach and take-over when you're indisposed.

'**Y**es, And'ers – the people that are able to build on your ideas, pushing them to a higher level; the motivators pushing you toward your finishing line; the people that seemingly always manage to turn a 'but' into an 'and'.

Seven key behavior-driving relationship patterns, which, somehow, cunningly manage to spell out the name Mercury.

So much for the model, the next issue is how we can detect the presence, absence, or indeed opposite of each of the seven patterns. As with the other PanSensic tools, the basic process works through a number of different steps:

Step 1: Keyword Scraping
Some words get used universally across all types of relationship. As with the Thinking Styles and JupiterMu tools, these tend to be nouns and verbs. So the first thing a media scraping engine looking to establish what type of interaction someone is currently in needs to do is look beyond these words to the pronouns, adjectives, adverbs, tenses and slang that tends to surround the core content of a sentence or block of text.

Over the past five years, we have been building and testing an ontology of Mercury pattern words. To date, we have assembled and validated a database of words and phrases attributable to each of the Mercury patterns that presently includes around 3500 entries.

Step 2: Contextualisation
Once keywords have been picked up, before we can attribute them to one or other of the Mercury patterns and an overall score, it is necessary to make some kind of a contextual relevance check. Which means that the first thing a context engine has to be able to do is determine whether a word or phrase present in the ontology is being used in a manner consistent with what the category is all about. The word 'and', for example, is an extremely common word that can sometimes relate to the 'Yes, And' Mercury category, but it would be wildly inaccurate to simply count all of the 'and's in a conversation and use them to affect the 'Yes, And' category. Only 'and's that are prefixed by some form of affirmative expression or statement ('it's a really good idea, and….') can meaningfully be counted as a positive. Perhaps the most significant intellectual property associated with the overall PanSensic capability is what might best be thought of as the contextualization engine.

Step 3: Scoring
Once a word or phrase has been found to be contextually relevant it is included in the scoring for the appropriate Mercury pattern category. We know from our validation work, finally, that some words and phrases are stronger indicators than others within each of the categories. The final part of the MercuryPhi algorithm, therefore, comprises a weighting analysis of each 'hit' before then outputting the relative scores of each of the seven Mercury categories.

Figure 2 illustrates the simplest form of output – where the engine is merely looking for positive examples of one of the patterns.

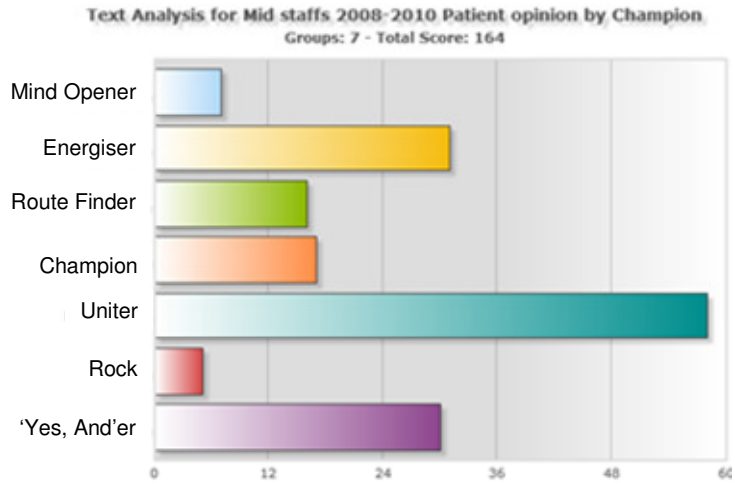


Figure 2: Typical MercuryPhi Scrape Output

In more sophisticated versions of the algorithm – where we're, for example, scraping email or social media conversation traffic (suitably anonymized and legal by the way, lest there be any doubt), we might well divide the seven categories into positive and negative halves such that not only can we search for evidence of, say, energiser relationship behavior, but also its polar opposite. The idea being that we can use the findings to help unravel dysfunction in team settings or market surveys and put in place actions that can help resolve excesses or deficiencies of any of the seven categories.

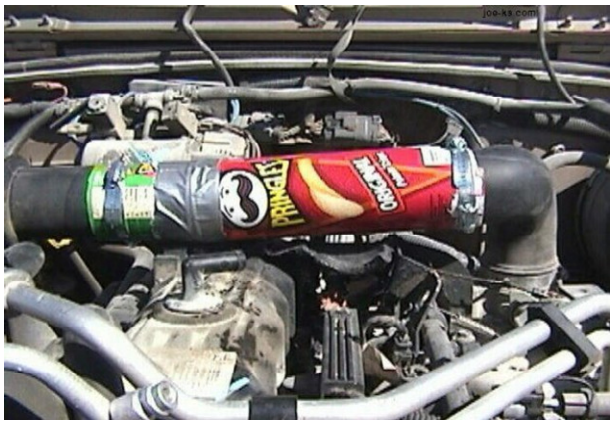
Ultimately, the basic premise upon which MercuryPhi is built is that in order to understand what drives behavior in groups it is essential to capture the bottom-up 'social DNA' of the group and the individuals within it. Electronic text is not the ultimate ideal way to capture this information, but it makes for an easy start, and, while clients might not directly understand what the MercuryPhi output is trying to tell them, the job of the entire suite of PanSensic tools is to enable the individual strands of DNA – like Thinking Styles, JupiterMu and, now, MercuryPhi – to be combined to create the top-down measures that managers and marketers would love to know about: how engaged are staff/customers? How much do they trust us? How authentic are we perceived to be? We can only meaningfully start to answer these kinds of question by examining the world from the DNA level upwards. No doubt future ezine articles and white papers will help us to complete the overall picture as all of the other strands begin to converge into a unified whole. Until then, we'd love to hear from any of our readers that feel they might have a potential application for the MercuryPhi tool.

References

1) Mann, D.L., Howarth, P., 'Jupiter$^{\mu}$: Closing The Say/Do Gap', Systematic Innovation White Paper Series, November 2012.
2) Rath, T., 'Vital Friends: The People You Can't Afford to Live Without', Gallup Press, 2006.

Not So Funny – Principle 26A, Copying

"Use simple and inexpensive copies in place of expensive, possibly vulnerable objects or systems" one of the world's favourite Inventive Principles. From Pringles…



…to Coca-Cola…

…from doormat carpets…

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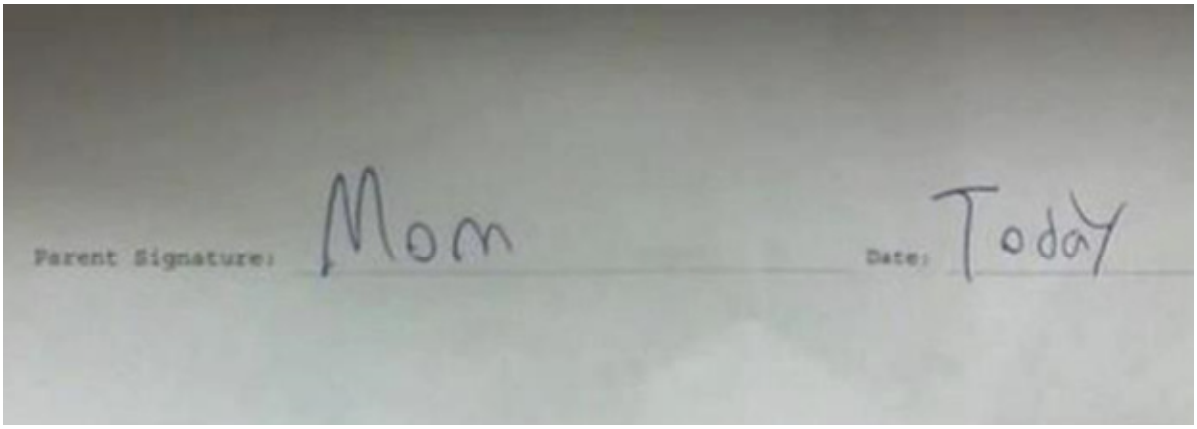
…to re-purposed vanity mirrors…

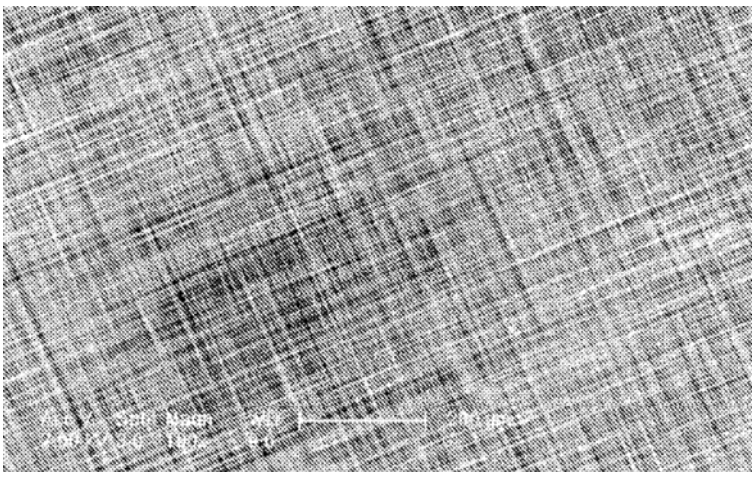
…from redundant scooters…

…to upcycled banana skins…

..the propensity to find alternative uses for lower-cost, Principle 26A, versions of things starts from an early age. Around about here:



Patent of the Month – Poisson Ratio Material



Is it cheating if this month's patent 'best of' award stays at the same university as last months? Perhaps there is something in the water at TsingHua University, or possibly they're in the middle of a programme to patent everything under the sun relating to carbon nanotubes (CNTs). Here's their latest elegant effort, granted as US8,545,745 on October the 1st:

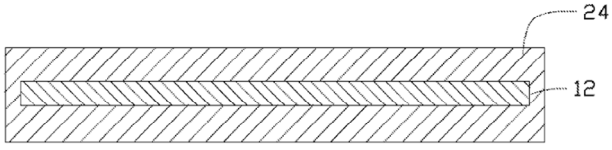
A method for using a Poisson's ratio material includes a carbon nanotube film structure is provided. The carbon nanotube film structure includes a plurality of carbon nanotubes. A first part of the carbon nanotubes are aligned a first direction, a second part of the carbon nanotubes are aligned a second direction. The first direction is substantially perpendicular to second direction. When the Poisson's ratio material is stretched or compressed substantially along the first or second direction, a Poisson's ratio value is negative. When the Poisson's ratio material is stretched or compressed in a direction having an angle of about 45 degrees with the first direction, the Poisson's ratio value is positive.

In terms of the contradiction being solved, we're very definitely in physical contradiction territory: we want Poissons Ratio to be both positive and negative. Their solution – interlayering the CNTs in different directions – represents a 'separation in space' strategy. Or Principle 17 if we wished to take the solution strategy all the way to the Inventive Principles.

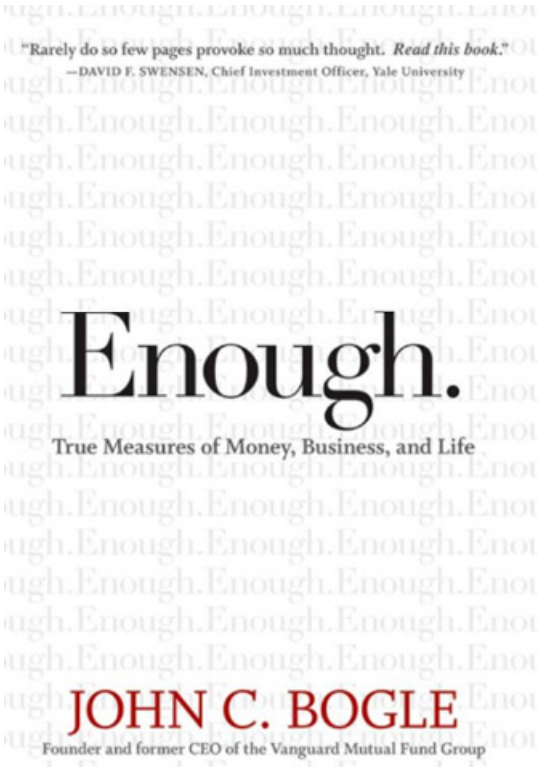
The inventors don't specify why they want both positive and negative Poisson Ratios – we can think of lots ourselves, based on our interest in auxetic materials over many years now – but they do say this:

The Poisson's ratio material has many advantages, including a large strain-to-failure and flexibility. It will be more applicable for practical applications where large strains are needed.

The only problem with the invention disclosure (and the reason we know the inventors didn't use SI) is that it covers only the perpendicular alignment of CNT layers. Our guess is that this will prove to not only make the patent vulnerable to design-around, but also – more importantly – means that several other functional advantages will be missed.



Best of the Month - Enough



Some books come to be more meaningful as time passes. John Bogle's diatribe against the follies and over-indulgences of the pre-GFC financial services sector was first published in 2009, at a point in history when the dust hadn't yet properly settled. While it's not clear that the financial crisis has either hit bottom or whether the dust has settled enough to see a way forward for the industry, it seems clear, to this reader at least, that Bogle's words of warning a) haven't been listened to in the years since the 2009 publication, and b) they serve today to beautifully and eloquently magnify what those that work in the industry seem to be doing all in their power to avoid.

That the book revolves around chapters that focus on a series of different contradictions probably explains part of the reasoning for this apparent rejection by the industry. Although, it might also be fair to say that in its craving for positivity, the industry has voted to reject anything that might feel like it adds to the onslaught of ill-feeling coming in from all walks of life. By the same token, this contradiction-focus is probably what should recommend the book to anyone reading this e-zine. Over its 255 time-flies-by-easy-to-read pages, Bogle covers three main topics – Money, Business and Life – further split into a total of 10 chapters:

Money:

1) Too Much Cost, Not Enough Value
2) Too Much Speculation, Not Enough Investment
3) Too Much Complexity, Not Enough Simplicity

Business:

4) Too Much Counting, Not Enough Trust
5) Too Much Business Conduct, Not Enough Professional Conduct
6) Too Much Salesmanship, Not Enough Stewardship

7) Too Much Management, Not Enough Leadership

Life:

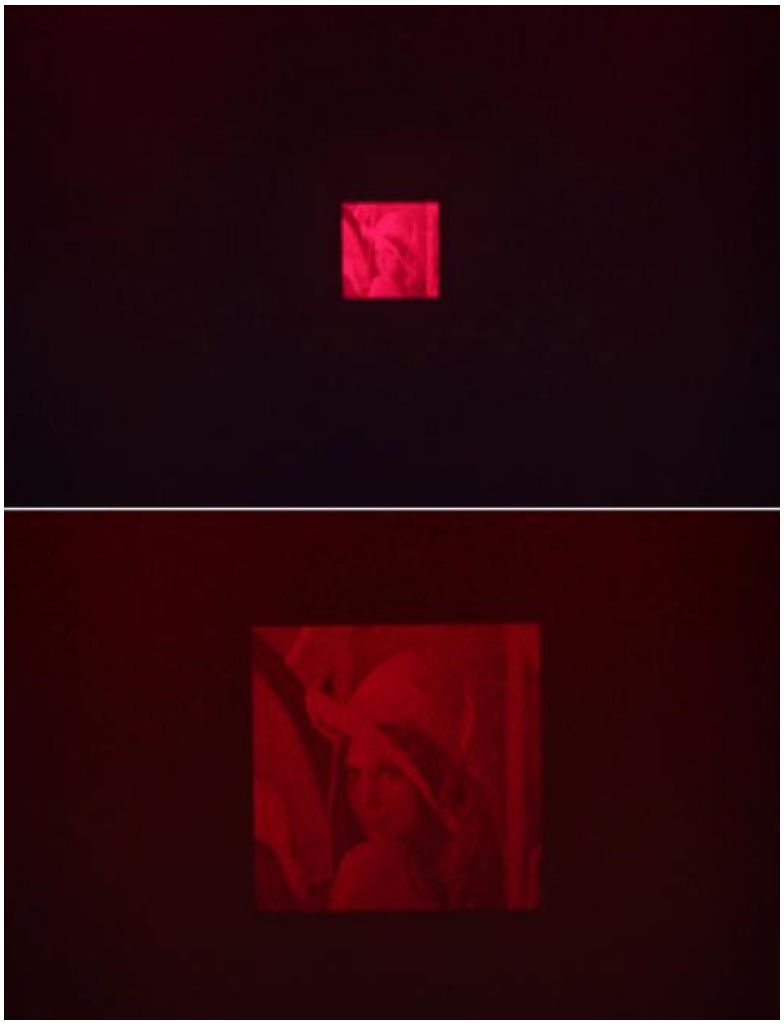
8) Too Much Focus On Things, Not Enough Focus On Commitment
9) Too Many 21st Century Values, Not Enough 18th Century Values
10) Too Much 'Success', Not Enough Character

All in all each chapter provides a sometimes jaw-dropping indictment of the industry. An industry that, not coincidentally, Bogle has devoted the whole of his 79 years to. It is clear throughout that Bogle, now at the end of a lifetime in the industry, like the angry pensioner that heads off on a tirade against the government, now has nothing to lose, and no reason to hold back and be polite.

Which probably also helps explain why the industry has largely ignored his warnings. So far at least. For the rest of us, the book not only makes for a 'oh my God, do they really do tht?' read, but it is also full of what used to be called 'horse-sense'. And a clutch of great aphorisms to throw into your next conversation with a nearby still-fat-and-happy financier.

Oh, and it might just get you to reflect more than a little about your own life.

Investments – Zoomable Holograms



Imagine giving a presentation to a roomful of important customers when suddenly the projector fails. You whip out your smartphone, beam your PowerPoint presentation onto the conference room screen, and are back in business within seconds. This face-saving application and others like it are the promise of a new generation of ultra-small projectors.

Now researchers from Japan and Poland have taken an important step toward making such devices more versatile and easier to integrate into portable electronic devices.

The team has created a small holographic projection system with a lensless zoom function. When fully developed the system should be cheaper and smaller than other projection systems. The researchers report their findings in a paper published this month in the Optical Society's (OSA) journal *Optics Express*.

Zoom functions magnify an image to fit on an arbitrarily sized screen, but they typically require complicated lenses and mechanical components. "A zoom lens in general projectors occupies a large area in the systems," said Tomoyoshi Shimobaba, a professor in the graduate school of engineering at Chiba University in Japan. "If I remove the zoom lens, the system will be small and cost-saving."

Though the new holographic lensless zoom is not the first lensless zoom system to be developed, Shimobaba notes that other systems require extra components. His team's system requires only a laser and an LCD panel.

In order to achieve a lensless zoom, Shimobaba, his colleagues from Chiba University, and Michal Makowski from the Warsaw University of Technology in Poland turned to holography. Holography is a way to produce images by using the interference pattern of two laser beams to encode and later display the image. By their nature holograms operate without lenses. It is possible to represent a holographic image with numbers and formulas and then calculate how that image can be magnified.

Shimobaba and his team made modifications to the standard magnification formulas to reduce calculation time and preserve image quality. Magnified holograms can suffer from a signal processing effect called aliasing, which can result in visual distortions of the original image. The researchers developed a calculation to reduce aliasing effects and also used a method developed by another team of researchers to reduce the speckle noise effect that can give holograms a grainy appearance. They tested the technique by increasing by nine times the size of a monochrome picture of a woman in a feathered hat. Currently the footprint of the holographic zoom system is about 160x80x40 millimeters, and Shimobaba believes the researchers can easily shrink it even further. "Currently we use commercial parts," he said. "However, if we customize the components we believe we can develop the smallest projector [to date] because our technique is in principle the simplest." He estimates that the technology could be commercialized in the next five to ten years.

Going forward the researchers plan to refine their mathematical image manipulation techniques to further improve image quality and reduce calculation time. They also plan to test the technique with color images… in which case they should go talk to TrueLife, who purport to have already solved that part of the overall puzzle.

More details at:

Tomoyoshi Shimobaba, Michal Makowski, Takashi Kakue, Minoru Oikawa, Naohisa Okada, Yutaka Endo, Ryuji Hirayama, Tomoyoshi Ito. **Lensless zoomable holographic projection using scaled Fresnel diffraction**. *Optics Express*, 2013; 21 (21): 25285 DOI: 10.1364/OE.21.025285

Generational Cycles – Feedback

Some words can come to mean quite different things to different people. Sometimes these differences are generationally biased. 'Feedback' seems to be one of those words. A word that has evolved some quite different connections to, quite unusually, each of the four main generational archetypes present in the Strauss & Howe research. In this article we explore some of those differences and speculate a little bit on the possible implications in the workplace and elsewhere.

Boomers

Partly due to their advancing life stage (the youngest Boomer has now had their 50th birthday), but mainly as a result of their indulged upbringing and narcissistic early adulthood, in their minds, feedback is something that Boomers give to other people, rather than receive. Feedback means 'let me tell you all the important things I know'. In their Moralistic 50s, this can often come across as 'I will tell you…' to other generations; in their Wise 60s, the preaching and bombast tends to get toned down, usually to the point that feedback will be offered only after it has been asked for.

When it comes time to receive feedback, if it is to be acted upon, it needs to be presented in a positive manner, with an emphasis on the opportunity to learn something new. Very often the best feedback to a Boomer is quite covert and something that they're able to discover and control for themselves. Many Boomers are quite competitive and like to know that they're doing better than, especially, their contemporaries. Feedback that lets a Boomer see how far they jogged, or how their physical and mental age is better than the cohort average (see the RealAge.com website for a classic example, is the absolute best kind of feedback.

A good visual image to represent feedback as perceived by a typical Boomer might look something like:

Nomads

Feedback for Generation X is a word that has generally negative connotations. A cohort that was 'Abandoned' as children meant that they were forced to develop a lot of self-sufficiency. If feedback was forthcoming during that abandonment, generally speaking it was to be told to stop doing something or to not do something or to not do it that way. Feedback, in other words, was something that was given to you when whatever it was you were or weren't doing wasn't good enough. Feedback was synonymous with 'telling off'.

Because they were raised with relatively little of it, Nomads tend to lack confidence ('I'm never quite sure whether I'm doing it right'), but also, now they're at a life stage where they're either parents or becoming managers inside the workplace, they tend to be reluctant or unnatural feedback givers. As parents, in no small part as a reaction to the absence of positive feedback received during their upbringing, there is a tendency to proffer lots of mainly positive feedback to their offspring. Needed negative feedback tends to be avoided, sugar-coated or, ideally, left to someone else (which is why we end up with a lot of blame passing between parents and teachers at the moment). The Nomad parent doesn't want to be 'bad cop' if they can possibly avoid it.

In the workplace, where the desire to avoid hurting the feelings of others is slightly less important, negative feedback will be given. Often in a manner that involves humour or sarcasm… which tends not to be understood or gets reacted against negatively if the feedback is being given to a Boomer or Generation Yer. Either way, the prevailing Nomad mindset is that 'I never had feedback, so why would anyone else need it?' Meaning that feedback usually finds itself at the bottom of the priority list when it comes to scheduling the tasks to be done during a working day. Nomads tend to be reluctant feedback givers. If you had to choose a single image that conveyed what feedback means to the typical Xer, it might look something like:

Heroes

Thanks to an upbringing that has seen them showered constantly with positive feedback (see what's coming back to haunt you, GenX parents!), the word has an overwhelmingly upbeat connotation in the Generation Y, Hero mind. Moreover, feedback has frequently also arrived alongside a physical reward in the past. School exercise books filled with gold stars and thumbs-up stickers; a pocket-money boost or gift when they receive a good grade on their homework; a trophy for coming 5th in the 25m swimming race.

The result of all of this positivity is a mental attitude of 'I can do anything', which then frequently turns into a lot of confusion when Y's enter the workplace and the sea of positive feedback slows to a trickle. Especially if, as is likely to be the case just as a result of generational timings, they're working for a GenX boss. GenX boss plus GenY subordinate turns out to be one of the most potentially dysfunctional of all inter-generational cohort combinations. And all because of their polar opposite attitudes and experiences with feedback.

Captured in a single image, for the typical GenY Hero, feedback might generally look something like:

The oldest Generation Y Hero is just entering their early thirties and hence the opportunity they've had to start giving feedback has been relatively limited. As far as we can see, when it comes to giving feedback to their offspring, they're tending to do more of what their parents did, albeit with a heightened awareness that the world has become a dangerous place and that there are therefore limits on what is and is not allowed. In the workplace, Heroes are likely to become a not so great (when viewed from the eyes of the receiver) combination of Boomer 'let me tell you' and their own trained-in arrogance of 'I told you I was the best'. In theory at least, once they've been through their 'quarter-life crisis' this unpleasant combination is likely to be toned down to the point that it becomes constructive and conducive to the effective working of the team – Yers were brought up, afterall, as great networkers and team players. A big part of their 'Hero'ism, indeed, comes from this collective harnessing of 'let's get the job done' energy and engaged verve.

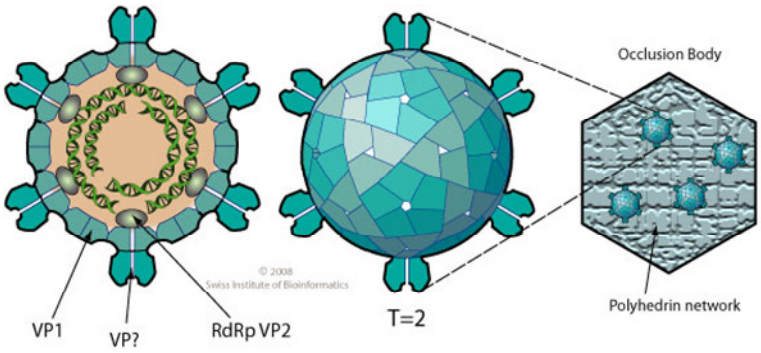
Artists

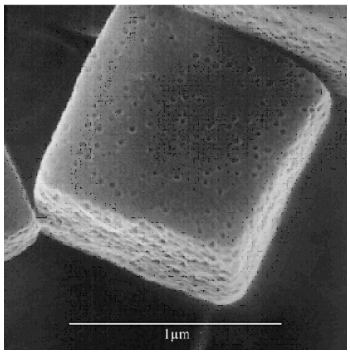
The current cohort of Artists is the as yet unnamed generation born after 2001. As such it is difficult to see directly how they respond to feedback. Looking back to the previous round of Artists – the so called Silent Generation – what we can see from their Suffocated upbringing is that feedback tends to look something like:

Life, in other words, is all about people and society telling me what is and is not allowed. The Silent Generation grew up with 'children should be seen and not heard' as the parental mantra, and now the post-2001 infants find themselves living heavily scheduled lives in which they're expected to do whatever mum and dad tell them is the right thing to do. The world is dangerous, they're in effect told from every angle, so these are the go/no-go rules we need to apply in order to keep you safe.

If the generational cycle repeats, when these Suffocated adults grow up to become Sensitive adults, they tend not to be great feedback givers. Artists are a very reflective and internally focused cohort and, per their name, tend to be wonderful at giving feedback to society in the form of the (often profound) books they write or the paintings they paint.

Biology – Cypovirus





We head down to the micro-scale for this month's biological wonder. Cypoviruses (and their close cousins, baculoviruses) are notoriously difficult to eradicate. The remarkable stability of the virus means that like, bacterial spores, these insect viruses remain infectious for years in soil. This despite whatever and however the environment might change. The environmental persistence of the virus is the cause of significant losses in silkworm cocoon harvests. Here's how we might best map that feat onto the Contradiction Matrix:

IMPROVING PARAMETERS YOU HAVE SELECTED:

Stability (21)

WORSENING PARAMETERS YOU HAVE SELECTED:

Other Harmful Effects Acting on System (40)

SUGGESTED INVENTIVE PRINCIPLES:

40, 35, 31, 17, 11, 24, 18, 30

The picture at the top of the article gives a first clue about the solution: cunning polyhedral shapes. A good illustration of Inventive Principle 17 and, combined with Principle 40, a good analogue for the actual Cypovirus stability solution.

Here's what a team of University Of Auckland researchers have to say on the subject:

Cypoviruses and baculoviruses are notoriously difficult to eradicate because the virus particles are embedded in micrometre-sized protein crystals called polyhedra. Although polyhedra have been extensively characterized since the early 1900s, their atomic organization remains elusive. Here we describe the 2 A crystal structure of both recombinant and infectious silkworm cypovirus polyhedra determined using crystals 5-12 micrometres in diameter purified from insect cells. These are the smallest crystals yet used for de novo X-ray protein structure determination. We found that polyhedra are made of trimers of the viral polyhedrin protein and contain nucleotides. Although the shape of these building blocks is reminiscent of some capsid trimers, polyhedrin has a new fold and has evolved to assemble in vivo into three-dimensional cubic crystals rather than icosahedral shells. The polyhedrin trimers are extensively cross-linked in polyhedra by non-covalent interactions and pack with an exquisite molecular complementarity similar to that of antigen-antibody complexes. The resulting ultrastable and sealed crystals shield the virus particles from environmental damage

If that solution wasn't miraculous enough, the researchers have subsequently taken the basic polyhedral shape and used to create some potentially very useful solutions. As such,

if they're successful, we might have on our hands another very elegant biomimetic example to add to the portfolio. The research team, alongside a Japanese commercialization partner, Protein Crystal Corporation, recently had a patent granted in the US – 8,554,493 if you're interested. Here's what the invention disclosure background section tells us:

Stable maintenance of molecules, and in particular functional molecules, on support surfaces can be critical for analytical and diagnostic tools--for example, in high throughput analysis and functional characterization of biomolecules. However, techniques for stably immobilizing and preserving functional proteins, biomolecules and biosensors on support surfaces have not been optimised.

Many prophylactic and therapeutic agents require special conditions to protect them from environmental damage during transportation and storage. This adds to the cost of the drug and, in certain instances, reduced availability in some communities eg. in remote and/or disadvantaged communities where conditions such as low temperature cannot easily be achieved during transportation over long distances.

Further, there is a continuing need for new pharmaceutical formulations, excipients, and delivery devices, including nanodevices, to achieve maximum benefit from drugs. For example, slow release and/or organ-/tissue-specific release of prophylactic and therapeutic agents can provide increased drug efficacy, improve bioavailability and reduce drug dosage. There is a need for versatile and safe means for administering agents intact and with site-specific and dose-specific accuracy.

The improved stability of viral particles within polyhedra has prompted studies investigating whether target proteins can be embedded within polyhedra for improving their stability and facilitating their use in protein microarray applications. This approach involved co-expressing target proteins fused to a portion of a virion structural capsid protein, VP3 during CPV infection. The results indicated that incorporation of these proteins into the polyhedron crystal was successful and that the proteins were protected from dehydration and stabilized against high temperatures without the loss of function. Proteins that have been incorporated into polyhedra using the VP3, are non-membrane and membrane proteins including, enzymes such as polymerases, kinases and acryltransferases; structural proteins such as ribosome proteins and ribosome binding proteins; and transcription factors; and elongation factors. Accordingly, the skilled addressee would understand that a diverse range of different types of molecules may be incorporated into a polyhedron without the loss of function.

Short Thort

"Nine-tenths of tactics are certain, and taught in books:
but the irrational tenth is like the kingfisher flashing across the pool,
and that is the test of generals."
T. E. Lawrence

"All men can see these tactics whereby I conquer,
but what none can see is the strategy out of which victory is evolved."
Sun Tzu

News

UK TRIZ Forum#5

The programme has finally (a whole fortnight before the actual event!) been finalized and can be found on the SI-Shop website. Or, more likely, if you receive this ezine, a copy will have been emailed to you in any event. This year there will be ten papers plus a panel session at the end of the day exploring the future of TRIZ/SI… a topic that will have been sparked at the beginning of the day with a keynote opening address from Ellen Domb. We hope to meet some of you on November 1.

Engineers Ireland

The flyer for the 20 November SI workshop has gone live on the Engineers Ireland website. Check it out or enroll here: http://www.engineersireland.ie/cpd-training/cpd-training/training-calendar/2013/november/a-practical-approach-to-systematic-innovation.aspx

Innovation In Music

It looks like we'll be attending (and presenting a TRIZ/Wow-and-forwards-to-the-PanGenic-PhD-project-at-Plymouth paper) at this year's biggest music and innovation

conference, to be held at the University of York from the 4th to the 6th of December. More details here: http://www.innovationinmusic.com/index.html

DTU Alumni Address
Darrell will be giving a one hour presentation to Danish Technical University alumni on the evening of 14 November. The talk, 'Measuring The Invisible 50% Of Your Business', will begin at 5.30pm Copenhagen time. Find out all the details here: http://www.business.dtu.dk/english/Kalender/2013/11/Open-Lecture

New Projects
This month's new projects from around the Network:

- Utilities – concept design study
- Transport – ICMM assessment
- Print – Strategy workshop
- Healthcare - PanSensic System Diagnosis Study
- Healthcare – Patient Experience design project
- FMCG – 'Invent To Order' project
- Financial Services – GenerationDNA project
- Aerospace – SI workshops
- NGO – strategy workshop