Slide: Transparency, Opacity, Antinomy: Pataphysics

Hello. Thanks to organisers etc.

Slide: Duck Soup' mirror scene

I'd like to begin with this clip from the classic Marx Brothers movie, 'Duck Soup'. I do so because it tells the story of my presentation more eloquently than I can in words. The clip is silent. Pay close attention!

Slide: Pataphysical Science

UBU: 'Pataphysics is a science we have invented, and for which a crying need has generally been felt.

Ubu's "crying need for pataphysics" has never been more strongly felt than it is today. Or I should say, to be precise: Ubu's "crying need for pataphysics" has always been felt in exactly the same way as it is now, and to exactly the same extent, but our *recognition* of this need has increased, just as Ubu's belly has inflated in advance of the broken fart that wafts the stink of significance over everything.

Dr Faustroll's objection to science lay in its generalisability:

"Contemporary science is founded upon the principle of induction: most people have seen a certain phenomenon precede or follow some other phenomenon most often, and conclude therefrom that it will ever be thus. Apart from other considerations, this is true only in the majority of cases, depends upon the point of view, and is codified only for convenience - if that! "

A science of the particular, of the laws governing exceptions and contradictions, is rather incompatible with empirical "truths". That statement would itself be a truth, were it not for the pataphysical requirement for it to have an exception. This is universal. "Faustroll defined the universe as *that which is the exception to oneself*". Jarry's pataphysics seeks to articulate this meta-metaphysics at both philosophical and personal levels simultaneously.

But pataphysics is not merely opposed to science. On the contrary, it is the science of sciences.

Slide: Bishop Mendacious

Neither is it merely opposed to religion, even though Bishop Mendacious is transported directly from the pages of Book XIII of Aldrovandi's 'Monsters' to pay grovelling obeisance to Dr Faustroll and Bosse-de-Nage, the dog-faced baboon who only ever says "ha ha".

Simple oppositions, against science, against religion, against the bourgeoisie, are insufficient to deliver pataphysical energy. Rather it is the oscillations between

the contradictory and the non-contradictory, between the exceptional and its antithesis, between the transparent and the opaque, that make up the pataphysical *gidouille.*

Slide: The *gidouille*

The gidouille delineates two spirals: the one that is drawn and the one that is described by the one that is drawn. Here we may discern the beginnings of pataphysical transparency and opacity, for the line is completely opaque, whereas the empty space between the line is transparent. The woodcut of Ubu was produced by first creating an object with peaks and troughs that correspond to the opaque and transparent marks on the paper.

But this is only representation. Transparency and opacity are embedded far more deeply in pataphysics than that. Bosse-de-Nage's repeated "ha ha" consists of two sounds of equal emphasis. Their meaning is simultaneously transparent and opaque. The usual interpretation says that it is a simple humour, a laugh at everything the Doctor is saying. But "A A" is not necessarily a laugh. Perhaps it is a nod of assent, or a nervous tic. Or even, in an empty-headed kind of a way, a signal merely that something has been heard, something whose significance is a mystery, hidden from our understanding. Beyond metaphysics. As Steve McCaffery, the Canadian sound poet, says: "it falls to us pataphysicans to continue Jarry's project, without knowing what it was".

Slide: 'Pataphysics

But wait! I should perhaps pause for a moment to describe 'pataphysics itself for the benefit of those unfamiliar with *the* science.

The word was invented by schoolboys (including Alfred Jarry) at the Lycée de Rennes in the 1880s, as a way of mocking their science teacher, an unfortunate man named Hébert. He became the butt of many jokes, including a collection of puppet plays in which he was transformed into the monstrous Ébé, who undergoes a series of Rabelaisian adventures and is baptised with "essence of pataphysics". These skits became the basis of Jarry's celebrated play *Ubu Roi,* first staged in 1896, which caused an enormous scandal and pretty much launched modern theatre. It's opening word, *merdre,* which is shit with an extra 'r', was delivered by Ubu, a puppet-like figure with a spiral painted on his belly, who turns out to be a Professor of Pataphysics. He swears by his green candle.

Jarry (pictured), who lived from 1873-1907, dying young partly from the effects of a lifestyle that involved poor nutrition and vast quantities of alcohol, developed the idea of pataphysics much further than Ubu. In a series of novels and other speculative writings he elaborated what he was eventually to define as "the science of imaginary solutions".

The pataphysical symbol is the spiral. A common trope in pataphysics is the simultaneous existence of mutually exclusive opposites, the pataphysical antinomy, if you will. Often this takes the form of word-play. For example, the

name ‘Faustroll’ combines the supreme magus Faust with a dangerous creature that lives under bridges from Norse mythology.

Another key idea, derived from Epicurus, is the clinamen: an accidental swerve of atoms that creates matter and by extension a deviation in meaning.

A third is the syzygy, the unexpected alignment. In astronomy, an eclipse is a syzygy. For Jarry, a pun was a syzygy of words.

The apostrophe before the word ‘pataphysics was only ever used once by Jarry, “to avoid an obvious pun”, he said, although it remains unclear exactly what that pun might be. Today it is used only with the noun, and to distinguish voluntary, or conscious, pataphysics from involuntary, or unconscious, pataphysics, as practised by everybody (for we are all pataphysicians).

Slide: Antinomy

The notion of antinomy captures the conference themes well. They are expressed as a series of oppositions, between dark and light, invisibility and visibility, transparency and opacity. Mutually exclusive, antinomial conditions.

Immanuel Kant identified four such antinomies. To give an example, the second of them is as follows:

Thesis
Every composite substance in the world is made up of simple parts, and nothing anywhere exists save the simple or what is composed of the simple.

Antithesis
No composite thing in the world is made up of simple parts, and there nowhere exists in the world anything simple.

Kant proves both these statements, then concludes that they are fundamentally meaningless because they cannot *both* be true. He gets around the problem by showing them both to be false. His purpose was to set limits on science and philosophy. (The other three antinomies concerned the limitations of the universe in respect of space and time; the problem of free will in relation to universal causality; and the existence of a necessary being). So Kant’s solution to antinomies was to transcend them by finding the conflict itself unreal.

Since Jarry’s project seeks to extend the limits of science into a universe supplementary to this one, in pataphysics such antinomial theses and antitheses can and do exist simultaneously. This is often expressed through arcane symbology, such as the plus-minus, a symbol created by spinning a baton across an imaginary stage. The pataphysical solution to antinomy, being imaginary, is beyond metaphysics. So, in Caesar-Antichrist, the figure of Ubu appears in an “Earthly Act,” declaring: “When I have taken all the Phynance, I will kill everyone in the world and go away”. He proceeds to *become* the plus-minus.

Slide: Definitions

It should be apparent by now that definitions of pataphysics are to be treated with caution. This is because the very notion of a "definition," which is a cluster of words that gives the specific sense of a term that holds true in all (or as nearly all as makes no difference) situations, is itself unpataphysical. How can a definition be exceptional, or contain its own contradiction? Nevertheless, there have been useful attempts at a definition of pataphysics, especially those of Jarry himself. In book II, chapter 8, "Elements of Pataphysics," of the *Exploits and Opinions of Doctor Faustroll, Pataphysician* (published posthumously in 1911) he offers the following:

Pataphysics […] is the science of that which is superinduced upon metaphysics, whether within or beyond the latter's limitations, extending as far beyond metaphysics as the latter extends beyond physics.

Pataphysics will be, above all, the science of the particular, despite the common opinion that the only science is that of the general.

Pataphysics will examine the laws which govern exceptions, and will explain the universe supplementary to this one; or, less ambitiously, will describe a universe which can be - and perhaps should be - envisaged in the place of the traditional one […]

DEFINITION. *Pataphysics is the science of imaginary solutions, which symbolically attributes the properties of objects, described by their virtuality, to their lineaments.*

Probably the most difficult part of the definition is the phrase "*which symbolically attributes the properties of objects, described by their virtuality, to their lineaments.*" Its purpose is, of course, precisely to lead the mind to a state of pataphysical awareness: freeing up our thinking by imaginatively extending all the aspects of an object or idea.

Slide: Collège de 'Pataphysique

The Collège de 'Pataphysique was conceived in 1948 in Adrienne Monnier's bookstore *La Maison des Amis des Livres,* which managed to remain open during the German occupation and continued for a further decade after the end of World War II. The aim of the Collège de 'Pataphysique is to document and explore pataphysics, not just in Jarry's work but in all its manifestations, including those 'patacessors' who developed *the* science unawares.

The head of the Collège, its "Inamovable Curator," is a fictional character: Dr. Faustroll, born at the age of 63, and accompanied on his travels from Paris to Paris by sea in a sieve by the dog-faced baboon Bosse-de-nage. The first and most senior apparently living entity in the hierarchy is therefore the Vice-Curator, who, at the foundation of the College, was His Magnificence Irénée Louis Sandomir (1864–1957).

Noted members of the Collège have included: Marcel Duchamp, Eugene Ionesco, Jean Baudrillard, Umberto Eco, the Marx Brothers, M. C. Escher, and many many more, from which you may observe that these are all people who enjoy playing at the limits of logic and language.

Today pataphysics is really a worldwide phenomenon, as exemplified by your invitation to me to speak at this conference. There are many pataphysical organisations in most countries, including this one, in which the Netherlands Academy of Pataphysics carries out its bâtaphysical works.

Slide: Questions

My aim in this presentation is to examine the conference themes in pataphysical terms. In particular, I have been asked to focus upon the following questions:

How can pataphysics turn the academic eye to its own blind spots, namely: to the relation between pataphysics and knowledge; the way we as academics conduct research; the perspectives from which we develop methodologies to produce forms of knowledge; and our professional coping strategies for the failure of the latter?

What is the role of imagination and surrealism and its presence/absence in academia?

In light of current trends, in which the humanities are increasingly pressured to account for its relevance to society or the economy, often in quantifiable terms, how necessary is it to protect the unaccountable, unforeseeable, sometimes inexpressible parts of research and to actually plea for some uselessness, or in pataphysical terms, *inutilious*, in the academy?

Pataphysical Knowledge

Let's begin with the question of pataphysical knowledge. This is by no means straightforward, since the very idea of a corpus of agreed knowledge is somewhat antithetical to the contradictory spirit of pataphysics. Nevertheless, we may observe that in a universe of exceptions and contradictions, any conception of knowledge will embrace the postulate of Equivalence. This has consequences for the humanities, since, to paraphrase Marie-Louise Aulard: "A page of the telephone directory has the same VALUE for us as a page of The Exploits and Opinions of Dr Faustroll."

But the pataphysical spiral takes us beyond statements of relative cultural value. Pataphysics generally agrees with Friedrich Nietzsche that "*pure logic* is the impossibility that grounds science". He argued that there can be no direct correlation between the absolute knowledge of logical certainty and the ever-changing world of real things, that the illogical is necessary for man, and that out of the illogical comes much that is good.

In the Nietzschean world-view our idealised condition has lost the pervasive illogicality that preceded logic. “Where has logic originated in men’s heads? Undoubtedly out of the illogical, the domain of which must originally have been immense.” (The Gay Science).

We may observe, then, that a good deal of knowledge remains opaque. As the wave of logicality surges through the academy, making transparent those things that were heretofore shrouded in opacity, the vastness of the unknown becomes ever more apparent, like the extent of antimatter or what Lord Kelvin called ‘luminiferous ether’, much to Faustroll’s delight.

Slide: Should pataphysics be taken seriously?

We should not forget, also, that the very stuff of pataphysics is a deeply serious humour. Consider Luc Étienne’s question—“should pataphysics be taken seriously?”

“At one time or another in his life, even if only dimly aware or not formulated clearly, the true pataphysician is confronted in his most intimate being by the following two propositions:

Proposition A
The true pataphysician takes nothing seriously, apart from ’Pataphysics . . . which consists of taking nothing seriously.

Proposition B
Since ’Pataphysics consists of taking nothing seriously, the true pataphysician can take nothing seriously, not even ’Pataphysics.

The true pataphysician must not take himself seriously. Thereby he will protect himself from a temptation to which, alas, so many of contemporaries surrender! (Étienne 1984)

This question will never really be answered, or at least, if it is ever satisfactorily answered, that will be an end to pataphysics. For every emphatic “no!” there will always be an equally emphatic “yes!” We may ask, incredulously: “but how *can* you take pataphysics seriously?,” to which the reply will come: “but how can you *not* take pataphysics seriously?” It is the very model of literal eccentricity: never calling itself “eccentric” yet always moving away from the centre, spiral fashion.

Slide: Pataphysics and the Academy

Pataphysics pervades the Academy or, more appropriately, the ubuniversity.

This is controversial on two counts: first, some pataphysicians regard academia as rather incompatible with pataphysics. This has its roots in Jarry’s skepticism about science, and a more general perception that the Academy is both useful and unimaginative.

Second, academics themselves are often inhibited from revealing the true extent of their knowledge of pataphysics. This is partly out of respect for the conventions of pataphysics, which demand a certain discretion, but a more significant inhibitor is the perception that pataphysics is, purely and simply, a joke. To add a pataphysical reference to an academic *résumé* is to invite peer ridicule.

Both of these positions ignore the reality of pataphysics. Jarry devoured Bergson in a way that was entirely consistent with good student practice: questioning yet engaged. A significant part of the Collège de 'Pataphysique itself emerged from a university environment, and much of its work is rooted in academic research practices. The books and journals of the Collège are a significant corpus of work.

My experience, moving in academic circles around the world, is that pataphysics is an open secret among university staff. These academics represent a cross-section, from senior managers to junior lecturers, from the humanities to the sciences. The involvement of luminaries such as the late satraps Umberto Eco and Jean Baudrillard has helped to establish this as a legitimate area of academic interest. Yet for most, the mere mention of the word is generally accompanied by a knowing smile or even a wink. Even so, some of the most hallowed groves of academia have actively encouraged pataphysical speculation, from the Oxonian cells of the 1970s to the Canadian, American, and now Amsterdamned, conferences of the twenty-first century.

Since publishing *'Pataphysics: A Useless Guide,* I have received many enquiries and discussions from all sectors and levels of the academy. Pataphysics turns out to be the most powerful transdisciplinary force. So, for example, I have been invited: to give workshops at the Architectural Association in London and the School of Architecture in Bergen, Norway, as they initiated vast pataphysical projects to design and re-design spaces; to keynote at the University of Philadelphia in a conference that sought to consolidate the importance of pataphysics in the digital humanities and related disciplines, which is now leading to a book entitled *Pataphysics Then and Now;* and in a few weeks' time I will be leading a co-located conference on pataphysics in Montreal as part of WWW2016, the world's leading web science conference. I have had letters and emails from undergraduates, postgraduates, lecturers and professors, as well as a significant number of non-academic researchers whose work is every bit as rigorous as anything to be found in the Academy, and occasionally more so!

The crying need of which Ubu spoke is all too apparent. This is an entry point point into the inutilious and the stuplime, the imaginary and the meta-metaphysical. The pataphysical apostrophe is more than a playful ambiguity that wrong-foots the reader and tries to exclude the word itself from the dictionary. It is a symbol of the desire for something that is simultaneously transparent *and* opaque.

But, let's not get too evangelical about this. As Duchamp showed, pataphysics is imperturbable in aspect. This quotation from Sandomir reminds us that this is not some philosophy of life, a *weltanschauung,* or system of thought, that will substitute for more familiar ones:

"Is there any need to wish pataphysics well in Buenos Aires? It was there, as it was everywhere, before we came into existence and it can do without the lot of us. It will always exist and will do without us altogether. It can even do without existing, for it does not even need to exist in order to exist."

Slide: Two Examples

In order to illustrate these points, I would like to examine two contrasting examples from the pataphysical literature which show what happens when an entirely subjective science collides with objective knowledge.

The first concerns Jarry's mathematical definition of God, which uses the most transparently abstract human system (mathematics) to attempt to make visible the most transcendentally opaque metaphysical entity (God).

The second example is literary: Jarry's novel of 1897, *Les Jours et les nuits* (Days and Nights), and in particular its mysterious chapter entitled "Pataphysics", which is a relatively neglected source of pataphysical insight.

The consideration of these two examples will lead on to a discussion of research methodologies and the question of professional coping strategies raised earlier. Our route to those topics will of course be spiriform. I will then conclude by introducing some of my own recent work in computer science which combines these two approaches and which, I hope, illustrates how incorporating the unaccountable, unforeseeable and sometimes inexpressible may nevertheless provide a foundation for research.

Slide: Lord Kelvin & Paul Valéry

Jarry was as obsessed with mathematics as with language, and applied the same anarchic imagination to numbers as he did to words. He found liberation through an extreme and ironic precision. He shared this enthusiasm with Paul Valéry, whom Jarry described as "our copataphysician and illustrious chronicler of the fourth Tetrahedron".

Dr Faustroll argues with Lord Kelvin in a series of telepathic letters. Both agree that number is the basis of everything, but Faustroll declares: "I am in that place where one finds oneself after having left time and space: the infinite eternal, Sir. "

In *César-Antichrist* the Fess declaims:

"The Pataphysician, axiom and principle of the identity of opposites, clamped on to your ears, and you, flying-fish, to your retractable wings, is the dwarf atop the giant, beyond metaphysics; he is, through you, the Antichrist and God as well,

horse of the Spirit, Minus-in-Plus, Less-which-is-More, kinematics of the zero left in our eyes, polyhedral infinity."

Jarry's treatment of algebra quite literally reaches its apotheosis in the celebrated definition of the surface of God. Faustroll plays a game with algebraic symbols in order to furnish a pataphysical proof. It is delivered in a didactic mode that exaggerates the precisions of its formulae. The memory of M. Hébert is still present, even in such rarefied material. The definition is superficial, focused upon surface rather than substance, but it nevertheless sees the resulting surface as evidence of the substance beneath. God occupies a three-dimensional space of indeterminate dimensions emanating from a single point: a metaphysical triangular projection. It is at this point that that the pataphysical precision begins:

Slide: Formula

Let x be the median extension of one of the Persons (of the Trinity) a, $2y$ the side of the triangle to which it is perpendicular, N and P the extensions of the straight line $(a + x)$ in both directions *ad infinitum*.

Thus we have:
$x = \infty - N - a - P.$
But
$N = \infty - 0$
and
$P = 0.$
Therefore
$x = \infty - (\infty - 0) - a - 0 = \infty - \infty + 0 - a - 0x = - a.$

At this point the mathematics has crossed a layer of abstraction: from metaphysics, via the fusion of triangles and the Trinity, into pataphysics. Taking nothing away from infinity only gives us metaphysics. But when one contemplates the symbolic game of this imaginary solution of an equation *as a whole*, one realises that the entire thing may be seen another way.
As the watch seen from the side is an ellipse, so the equation seen sideways may be a pataphysical totem-pole, or a physick-stick made from a series of impossible relationships between imaginary solutions.

Jarry's concluding "simplification" reinforces the virtuality of both God and pataphysics:

GOD IS THE TANGENTIAL POINT BETWEEN ZERO AND INFINITY. Pataphysics is *the* science . . .

Slide: Boris Vian *Calcul...*

The Collège de 'Pataphysique has continued to develop Jarry's mathematical speculations, most notably through the work of Boris Vian, whose *Calcul numérique de dieu par des methods simples et fausses* included such richnesses as:

Dieu = deux + i - x = 2 + i - x

[…]

Deux + Deux = 4

(Dieux - i) + (Dieux - i) = 4

Dieux + Dieux - 2i = 4

Dieux - 2i = 4

Dieux = Deux + i = 2 + i

2 + i - 2i = 4

2 - i - 4 = 0

i = -2

Dieu = 1 – 1 = 0.

Slide: Jootsy Calculus

More recent mathematical game-playing which explicitly acknowledges its pataphysical origins includes JOOTSY (Jump Out Of The System) Calculus. This, we are informed by André Joyce (a Franco-American pataphysician whose name appears to be a pun), is a branch of metamathematics "derived from the Chinese philosopher and that protopataphysicist, Dzu-tse (also known by the Latinized Jucius and the Anglicized Jootsy)." It allows calculations to "jump out" of their alphanumeric system into any mathematical representation included in the set of Generalized Orthographic Denotations, or GOD. So, for example, to solve 2 + 2 = x, there are many possible answers other than 4. These include inversion (read upside down) "(9 - 8)(9 - 8)" or the 'T-Math' "2 teacups plus 2 teacups = 40 cups." "Honest calculations" have the same number of letters as the meaning of the expression, so: one plus twelve = 1 + 12; seven plus seven = 7 + 7. There are many similar examples.

Slide: Days and Nights: novel of a deserter

It is not difficult to see, by looking at this photograph taken in 1896, why Jarry was constitutionally unsuited to military life. *Days and Nights* describes the thirteen months of his conscription in 1894-5, and includes a comical account of his failings as a soldier. He was invalided out of the army in 1895, having

intentionally swallowed picric acid to escape his duties. In that sense he was a 'deserter', as the novel's subtitle implies.

Jarry's problem with the army was not simply his own ineptitude, but a more profound rebellion against its need to reduce the wills of the individual soldiers to a collective stupidity. Since Jarry, who takes the name 'Sengle' (single) in the novel, believes himself to be superior to "the herd", on whom he showers contempt, it is not surprising to find him coming into terminal conflict with that famous oxymoron: military intelligence.

Days and Nights is an immensely complex novel, written in a variety of styles which rapidly intercut one with another. It anticipates the work of James Joyce and others in its use of interior monologue, fractured narrative, poetic intervention, obscure and dense prose.

A persistent theme throughout the book concerns oppositions, such as the one implied by the title. The novel begins by alternating chapters which describe daytime events as though they are happening at night – all nacreous and vague - and night-time events as though they are happening by day – all lucid and stark. Even this inverted opposition rapidly breaks down after a few chapters, as the novel dissolves into more and more complexity. Other oppositions arise, all contradicting one another and disrupting the narrative flow: between the present and the past, memory and anticipation, dream and reality, perception and hallucination. The military obsession with whiting blacking and blacking whiting seems to symbolise these oppositions between the transparent and the opaque, and as small amounts of white make their way accidentally onto the black parts of a military uniform, so the line separating these oppositions begins to blur.

Sengle/Jarry tries to flee daily reality by desertion into nightly delirium. He achieves this by drugs, by sex, by love, by alcohol, by guided dreaming, by digression, by fevered imagination, by all the means available to an intellectual and poet who seeks to escape from the quotidian world. In a recurring metaphor, he describes how he "read in a Chinese book this ethnology of a people foreign to China, whose heads could fly up to the trees to seize their prey, connected to their bodies by an unravelling red thread, and [who] are then able to return and fit back onto their bleeding necklaces". So far, so very *fin-de-siècle* and decadently Symbolist.

Slide: Roman Scales

In Chapter 2 of Book 4, entitled 'Pataphysics', Jarry takes all this to a level that has particular relevance for this conference. The chapter begins by asserting Sengle's ability to control the behaviour of small objects in the world, such as the throw of dice, by effort of will. He goes on to say that "it is by no means certain that there is a difference, even in time, between thought, volition and act" and that "he did not distinguish at all from his actions, nor his dreaming or his waking".

He quotes Taine (Jarry misattributes this to Leibniz) in saying that "perception is a hallucination that is true", only to elaborate this with the contrary statement: "hallucination is a perception which is false, or more exactly: *faint,* or better still: *foreseen (remembered* sometimes, which is the same thing). And he believed above all that there are only hallucinations, or perceptions, and that there are neither nights nor days (despite this book's title, which is why it has been chosen)".

He writes:

"The world was simply a huge ship, with Sengle at the helm; and contrary to the Hindu concept of the huge Tortoise carrying the tiny universe, the least absurd image was that of the Roman scales, where a fabulous weight was reflected (the intermediary fulcrum of the balance-beam being the lens, though this supposition is contrary to all the laws of optics) and balanced by Sengle."

Notice how we have moved from purely poetic speculation to the business of physical measurement, and how pataphysical subjectivity persists in counterbalancing the might of conventional science. The Roman scales, most commonly a symbol of justice, were adapted by Lavoisier and others to enable extremely precise measurements. Lavoisier, reading through a fulcrum magnifying glass, was able to disprove the phlogiston theory - that a fire-like element called phlogiston is contained within combustible bodies and released during combustion – and so coin the term 'oxygene' for pure air (in the celebrated Easter Memoir of 1778). In Jarry's universe, ether replaces oxygen, (he resorted to drinking ether when his alcohol supply ran out) and the precise pataphysical measurements lead eventually to the concept of "ethernity" introduced in *Faustroll.*

But the 'fabulous weight' of the perceived world is not only balanced by Sengle. It is also *reflected* by him, an image which hints at his peculiar view of love, described in a earlier chapter 'Adelphism and Nostalgia':

"The present, possessing its past in the heart of another, at the same time lives out its Self and its Self plus something. But, if a moment of the past or present existed separately at one point in time, it would be unable to perceive this Plus Something, which is quite simply the Act of Perception. This act is, for the creature that thinks, the most supreme enjoyment conceivable: there is a difference between that and the sexual act of brutes like you and me."

This auto-ethnographical statement asserts the superiority of an intellectualised hallucination. Jarry is no Antonin Artaud, aiming for the revelation of a visceral truth. Rather his detached perception is the thought of a head that has left the body, born out of sexual confusion, of maladaption, of tomfoolery, of experimentation. The alchemy of self-transformation is not so much negated by the chemistry of Lavoisier, but rather reassigned to a new role in which knowledge is bound up simultaneously in oneself and in that mysterious Other that Jarry calls the Double. Thus words may become gold.

Slide: The Tacit Dimension

Epistemologically, notions of a lost illogicality seem to point to a tacit dimension. That is to say: the stuff that we know but do not know how we know it, nor even what it is that we know. This is typically contrasted with propositional knowledge (i.e. facts) and procedural knowledge (i.e. processes). As Mike Polanyi famously wrote: “we can know more than we can tell”. Thus, if a cake is a proposition or factual knowledge, and the preparation or baking of a cake is procedural knowledge, then the means by which ten people, given the same ingredients, time and recipes, produce ten different cakes, is an expression of tacit knowledge.

Tacit knowledge has informed a whole new interdiscipline of knowledge management. One of its leading theorists, Ikujiro Nonaka, has produced, in an act of unconscious pataphysics, this “knowledge spiral”.

Nonaka says tacit knowledge is: “highly personal. It is hard to formalize and therefore difficult to communicate to others ...tacit knowledge is deeply rooted in action and in an individual's commitment to a specific context ...tacit knowledge consists partly of technical skills [and partly] of mental models, beliefs and perspectives so ingrained that we take them for granted and cannot easily articulate them.”

In his view, explicit and tacit knowledge complement one another through four stages: socialization, externalization, combination and internalisation. This is the SECI model. The first step, socialization, transfers tacit knowledge between individuals through observation, imitation and practice. In the next step, externalization is triggered by dialogue or collective reflection and relies on analogy or metaphor to translate tacit knowledge into documents and procedures. Combination consequently reconfigures bodies of explicit knowledge through sorting, adding, combining and categorising processes and spreads it throughout an organisation. Lastly, internalisation translates explicit knowledge into individual tacit knowledge. Eventually, through the "knowledge spiral", knowledge creation and sharing become part of the culture of an organisation.

Apart from the symbol of the spiral, this theory is pataphysical in the way that it encodes certain illogicalities. For example, if the defining characteristic of tacit knowledge is that it cannot be articulated, how can it be made explicit? It is exactly this kind of ambiguous reasoning that provides the conditions for creativity.

Slide: Mode 1/Mode 2

Whereas some organisations actively encourage the ‘knowledge spiral’, others resist. Universities, unsurprisingly, privilege explicit over tacit knowledge. Tacit knowledge may become an object of study, but it is insufficient to enable one, for example, to succeed in a PhD viva voce examination. Indeed, its suppression, or

perhaps post-hoc rationalisation, is more or less an essential pre-requisite for academic success. Illogicality suffers a similar fate, although there are sciences that try to account for it – one thinks of chaos theory, fuzzy logic, and so on. But these are approached in an intensely logical way. Illogical thinking itself leads rapidly to the exit door.

All of which leaves the more creative disciplines, particularly the arts, as the main academic arena within which the unaccountable, unforeseeable, and inexpressible parts of research are more easily admissable. Time does not permit a full consideration of the many and complex issues surrounding the emergence of artistic research, or practice-based, or practice-led research, call it what you will. Still less do we have time to explore auto-ethnography as a research method. Suffice to say that these remain contested areas of knowledge formation. I sit on several European research councils and I would observe that in general the most successful way for this kind of research to get funding is to present it, however loosely, within a positivistic framework. This often contradicts the very essence of the research itself which goes beyond phenomenological methods to what I would name: epiphenomenological methodology. That is to say: research which, like a clinamen, is a by-product of a more approved research processes.

I should add that the resistance to knowledge formation of this type comes as much from the humanities as from the scientific community. Perhaps engineering and art are a little too closely allied for comfort, in producing new artefacts to embody knowledge. At any rate, they are often seen as poor cousins of more theoretical pursuits.

But there does seem to be something of a shift in attitudes taking place, stimulated somewhat by transdisciplinary theory and notions of "mode 2 knowledge". Artistic research is sometimes being added to scientific enquiry in a way which is clearly designed to encourage the serendipitous discovery alongside the more prosaic and traditional explicatory roles of artists working in science. Where Mode 1 knowledge follows the traditional pattern of scientific enquiry, Mode 2 knowledge is usually transdisciplinary, applied, often located in virtual networks, subject to new forms of socially enacted validation and, most importantly from a pataphysical perspective, the result of a reflexive process. The notion of objective 'truth' relies upon a stable research environment. Quite clearly, today's research is unstable and shifting.

This is partly because digital technology has changed the game. Most knowledge today is actually simulation or the result of a computer process. From nanotechnology to astrophysics, the computer model is the only available means to conduct research. The same is true in the humanities, from big data studies of cultural phenomena to 'digital humanities' approaches to textual analysis. Research methods have profoundly changed as a consequence. What was once hidden information is now readily available to the individual seated at their home computer. Even the Collège de 'Pataphysique, which occulted itself for the last decades of the 20th century, has now disocculted and become, for the most part, public domain. Its opacity, which was one of its principal attractions in

those years, has become transparent. To me, the most interesting aspect of pataphysics today is how ideas are evolving and spreading.

Slide: The Consolations of 'Pataphysics

At this point, I will become a little personal and perhaps somewhat anecdotal as I try to address the question of our professional coping strategies for the failure of our attempts to construct research methodologies. As an artist-researcher who is also a computer scientist, I have found myself frequently in situations of great difficulty when trying to engage my creative instincts within a research context. I also spend a great deal of time dispensing advice to PhD researchers who are engaged in their own personal struggles in this area.

I wish I could say that there is a single, clear path to methodological success, but there is not. So much depends on the individual researcher, on the context, and on the way the journey of knowledge discovery unfolds.

In the years following my joining the Collège de 'Pataphysique in the early 1980s, the main consolation of pataphysics was in helping me to develop an ironically conformist attitude to university administration, most of which is absurd. Since the Collège is structured like a cross between the Catholic Church and a university, the delicious hilarity of its organisation was a comfort as I tried to deal with the reality of life as an academic. I never discussed my pataphysical work in an academic situation, partly because of the occultation of the Collège and the consequent fear of the wrath of other pataphysicians and partly because I wanted to keep the two things separate. But it was pataphysics that kept me going during the years when musical composition as research was still being contested, an argument that has recently been revived by composers themselves! And still I use pataphysics to cross academic disciplines all the time, as I have always done. This paper is an example of exactly that.

More recently, things have changed. My *Useless Guide* seems to be riding a new wave of interest in the subject that is more than just historical curiosity about Alfred Jarry and his ideas. From the Pataphysical Slot Machine built by academics from Stanford and researchers at Apple, to the marvellous Musée Patamécanique in Rhode Island; from the Académie québécoise de la 'Pataphysique's work on code, to the development of Christian Bök's 'Xenotext' project to engineer a DNA poem that is both a living archive and a machine writer, there is a real and pressing sense of the need to protect the science of imaginary solutions in the context of a global neo-liberal project that is gradually squeezing them out in favour of a determined and thoroughgoing utilitarianism.

Pataphysics is *inutilious* and represents perhaps our best attempt to date at a science of uselessness. Its apparent nonsense is a means whereby we can access the kind of divergent thinking necessary for creativity. As Jarry observed, a watch seen from the side is an ellipse. The reason why people say a watch is round is because they only consider its utility. We *must* find ways to preserve the sideways view, to reach beyond the physical, and the metaphysical, to the pataphysical.

Slide: Creative Computing

Now I would like to offer an overview of some of my own recent research in Creative Computing, which shows how I am attempting to integrate pataphysics into research. The idea behind creative computing is that computers may be able to help human creativity better by being more than just a tool. We need somehow to reconcile the opacities of human ambiguity with the need for transparent precision of computer systems.

For Creative Computing to be truly creative, it must be surprising, playful, inventive, even humorous. The link between play and creativity is by now so well established as to have become an accepted fact. Johan Huizinga argued the case persuasively in the 1940s (Huizinga 2001), and Roger Caillois continued the theme in the 1960s (Caillois 2001). Stephen Nachmanovitch summed up the main argument in 1990:

Improvisation, composition, writing, painting, theater, invention, all creative acts are forms of play, the starting place of creativity in the human growth cycle, and one of the great primal life functions. Without play, learning and evolution are impossible. Play is the taproot from which original art springs; it is the raw stuff that the artist channels and organizes with all his learning and technique (Nachmanovitch 1990, 42).

For software engineers, the notion of creative play has no less potential than for artists. Indeed, I have argued that writing software and making art are fundamentally similar activities (Hugill & Yang 2013). It is perfectly possible to be highly creative in code, to display "learning and technique", to improvise, compose, and write, even to paint and dramatise.

Pataphysical knowledge consists of exceptions, contradictions, particularities and imaginary solutions. The computational corollary to the question "how may we think illogically" is: "how may computers reason illogically"? Here is my attempt in that direction.

Slide: PRASCAL

PRASCAL reworks the traditional programming language PASCAL by making pataphysical interventions within its structs. PASCAL is an old language, which was chosen because it is neither object-oriented nor aspect-oriented. It is also ready for some creative abuse! The addition of an 'r' introduces a "rascal" into PASCAL, which seems appropriate given the creatively playful ambitions.

First, PRASCAL introduces some new operators that allow us to cross levels of abstraction. These are the standard mathematical operators +, -, *, /, preceded by an apostrophe. Since Pataphysics extends as far beyond metaphysics as metaphysics extends beyond physics we may express the implied crossing of levels grammatically as shown.

<Physics> ’+ <Physics> ::= (is defined as) Metaphysics
<Metaphysics> ’+ <Metaphysics> ::= Pataphysics

<Pataphysics> ’- <Metaphysics> ::= Metaphysics
<Metaphysics> ’- <Physics> ::= Physics

<Physics> ’* <Metaphysics> ::= Pataphysics
<Pataphysics> ’/ <Metaphysics> ::= Physics

Slide: Crossing levels of abstraction

If we take a frog as an instance of physics and Heqet (the Ancient Egyptian frog goddess) as an instance of metaphysics, then a hoquet (hiccup, or antiphonal musical technique) is, by a clinamen (deviation), an instance of pataphysics. This gives us the following examples:

frog **’+** frog = heqet
heqet **’+** heqet = hoquet

hoquet **’-** heqet = heqet
heqet **’-** frog = frog

frog **’*** heqet = hoquet
hoquet **’/** heqet = frog

frog hic plus frog is heqet
heqet hic plus heqet is hoquet
hoquet hic less heqet is heqet
heqet hic less frog is frog
frog hic times heqet is hoquet
hoquet hic by heqet is frog

Slide: Patadata

The concept of patadata has been elaborated by James Hendler and myself in the paper: “*The syzygy surfer*: (Ab)using the semantic web to inspire creativity”. We explain that: “patadata is to metadata as metadata is to data” and proceed to build a semantic search engine that takes you not where you think you want to go, but somewhere you never expected to go but are glad you went when you arrive! We state:

“In thus envisaging a layer of meta-metadata, we will benefit from the ambiguities thrown up by the process of metadata creation, precisely those human ’shortcomings’ identified by Doctorow (2001) in his ’Metacrap’ thesis: lying, laziness, error, subjectivity, plurality, and so on. But we will also be able to insert our pataphysical declensions into the metadata harvest in a way that will

enrich the creative interaction, rather than just deliver a series of obvious mistakes".

The syzygy surfer was used, for example, in the creation of my online opera *The Imaginary Voyage* and in Fania Raczinski's creative search tool for *Dr Faustroll.*

Slide: Uboolean logic

In traditional Boolean logic there are two possible states: True (T) and False (F). *Uboolean* logic allows a third state, the FalsTrue (FT), in which something is simultaneously false and true. These truth tables present the outcome *z* when the basic Boolean operations conjunction (and), disjunction (or) applied to *x and* y. There are similar tables for Not and XOR.

I don't propose to spend any time going into the detail of this. For those who are interested, a paper has now been published in the International Journal of Creative Computing. However, I will observe that, as logicians amongst you will have spotted, this bears a superficial resemblance to theories of many-valued logics that have been around since the 1920s. There is a significant difference, however. Many-valued logics focus on a value called *I,* or sometimes *D* or *m,* which is indeterminate, or undecided, or paradoxical. The general descriptor for this is the "included middle", where there is a condition that is neither true nor false at a given moment.

Uboolean logic, by contrast, describes the simultaneous existence of mutually exclusive opposites. The FalsTrue is not some indeterminate, undecided, divided, or even paradoxical, instance of an included middle. Rather it is an explosive combination of irreconcilable states of affairs whose only possible outcome is an imaginary solution. This cannot be instantiated, because there is no generalisable example of a standard imaginary solution arising from a FalsTrue condition. Any such example is by definition exceptional. Herein lies the crucial distinction: uboolean logic aims to stimulate creativity through pataphysical knowledge. In other words, it is inherently illogical, subjective and ungeneralisable, in short: human. As Robin Ahlgren recently commented: "We really need a step sideways in logic so that we can think more humanly and in less black and white terms. Jarry's "correspondence" with the scientists of his day seems to reach out for a more natural, less severe form of science." (Ahlgren, private message to author, 9.3.16).

Uboolean can be used, for example, to express Einstein's theory that light is both a wave and a particle. It is ready for quantum computing, I think.

Slide: Some Pataphysical Functions

Here are some pataphysical functions in PRASCAL.

- absolu (string) → string (the absolu value will always result in a cliché)
  - absolu(frog) = a frog in the hand is worth two in the refrigerator.
- antinomy (string) → string (the antinomy function is self-contradictory)

    - antinomy (brother) + antinomy (cheese) = You do not have a brother and he likes cheese (cf. Perec).
- epiphenomenon (cstring) → string (an epiphenomenon is a by-product)
    - epiphenomenon (spaghetti) = steam

There are many more.

Slide: Marxism

Finally, to conclude, let's return to the opening clip from 'Duck Soup'. Chico runs into the opaque surface of the mirror because he believes it to be transparent. It shatters. Now realising its transparency he uses its supposed opacity to try to fool Groucho. Groucho is suspicious, but needs to test whether the reflection from the imagined opaque surface is really a transparency or not. They mimic one another for a while in increasingly improbable ways, but gradually the transparency and the opacity dissolve into one another as they step through the imaginary mirror. They are perhaps complicit in this crazy game. When Harpo enters, the illusion apostrophises into pataphysical mayhem. The scene does not really end, but the normal laws of physical reality are re-asserted by a directorial cut to a newspaper.

This, ladies and gentlemen, is my talk in a nutshell.

Slide: Thank You!

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I could end, if you like, by playing an aria from my opera.