

**Realizing Possibilities:
Effective Action in the Real World**
a conversation with James Wilk
on the Philosophy, Science and Art of Change

Introduction, by *Dave Franzetta, President, Interchange Associates, Inc.*

You know how it is when you've finally achieved some objective after a long time trying—often, you look back and realize that it was just one small thing you eventually did, or stopped doing, or did differently, that enabled it to happen. If only you'd realized earlier, you would have done only that one small thing in the first place and the rest would have followed naturally, saving yourself a lot of wasted effort. Now just imagine the possibilities if you could rapidly pinpoint that one small thing *right at the beginning of your effort*. And that's just what James Wilk's scientific work has made possible.

But, who, exactly, is James Wilk? Wilk runs an international think-tank, Interchange Research, an independent scientific research enterprise devoted to the study of the phenomena of 'directiveness' in nature and in human affairs. The rigorous study of these phenomena—including control, intervention, evolution, adaptation, purpose, complexity, and design—has given rise to powerful new scientific concepts and methods of analysis whose practical applications have come to be referred to under the heading of "minimalist intervention." A philosopher and scientist, he is on the faculty at the University of Oxford where he has researched and taught for many years.

As for me, after ten years as a client of Interchange Associates, which licenses the commercial application of the Interchange Know-How, I joined Interchange as a partner in that enterprise more than five years ago. Fifteen years of exposure to the practical application of Wilk's work, participating first hand in the creation of several hundreds of successful minimalist interventions, has delighted and inspired me, and has changed my way of thinking about the world, and what is truly possible.

Wilk has always stressed that to benefit from these analytical methodologies it is neither necessary nor particularly helpful to know anything at all of the highly technical scientific and philosophical ideas behind them. My experience as a client confirms that view. However, in order to get a better understanding of these powerful and provocative ideas, Wilk and I held a number of conversations over a two-month period earlier this year. What follows is based on the give-and-take of those conversations.

Einstein once said that science aims to make things as simple as possible but not more so. My conversations with Wilk attempted to draw out, in the simplest possible terms, some of these challenging ideas, which Wilk has almost certainly taken further, in theory and in practice, than anyone else to date. My principal concern, however, was to make clear the way in which the ideas themselves give rise to the revolutionary, often startling practical applications he and his scientific and philosophical colleagues have developed.

The Quest

DF: *I'm going to start with what should be a simple question. . . James, What exactly is it you do?*

JW: Well, the simple answer is, “as little as possible.” That’s what my work is all about: enabling people to do as little as possible to secure their desired end-result.

DF: *Well, that may be true, but that’s not the answer I’m interested in. You’ve hardly been practicing what you just preached: Look, you’re an established Oxford philosopher and scientist—I’ve known you for over fifteen years, so I know that you’re also an experienced, practicing clinician, and a longtime business adviser to corporate CEOs. From your Oxford undergraduate days on, you’ve been on a research journey along parallel tracks running through academic philosophy, cybernetics, neuroscience and complexity theory; with a few long stops in the social, cognitive, behavioral and systems sciences; and a detour or two through theoretical biology, semantics, semiotics, and a host of other fields—I have no idea what some of these disciplines involve—collecting impressive academic and professional credentials along the way. And in addition to all this academic work, you’ve been doing clinical things, working on practical applications in industry—and you continue to work in many of those areas of scientific research in one way and another. I can understand why the Oxford University website describes your career as having been less of a career than a meander, but I also happen to know that you were on the trail of something really big that makes sense of all your apparent wanderings. What were you looking for?*

JW: Well, you’re right. My meander was more of what is known in oriental traditions as a “path”—you follow your nose; you go wherever the path leads you, cutting your way through the jungle when you have to, more path-finding than path-following. I was hunting something down. Those fields you rattled-off were the fields in which I had to train and work in order to pursue my chosen quarry—the study of change or transformation in nature and in human affairs. Or to change the image, they were all little more than the venues in which I had to play. Despite appearances of being a polymath, I’m really only a one-trick pony. My field just didn’t have a name before I gave it one.

DF: *Which is?*

JW: It’s “metamorphology”—actually an old word, but it hasn’t caught on yet. I tend just to talk in terms of “minimalist intervention.” In any case, my one and only field of research all these years has simply been the transformation—in any sphere—from one pattern to another.

That topic is both very broad and quite narrow at the same time. It’s narrow in its focus, broad in its sweeping implications and range of potential applications. In fact it’s as broad as it gets, and it turned out it was also broad in the range of philosophical and scientific problems that needed to be tackled, and solved, as I went along. If no one else was going to address these subsidiary questions (and in some cases it turns out no one else was interested) then I had to do it myself: “a dirty job but someone’s got to do it.”

More to the point, loads of these answers were already lurking there in the literature, in odd places—the fruit of the labors of a lot of brilliant people working in only *apparently* unrelated areas of science and philosophy, mostly since World War II, but a few going as far back as the 17th Century. I’m currently writing up a potted history of the field over the past 80 years, singling out some of the pioneers whose coattails I’ve been riding on. Anyway, that gave me most of the pieces of the jigsaw, and the rest, the missing pieces, I had to figure out through my own research. That was the really tough bit. So, like the definition of an engineer as “someone who learns whatever he needs to learn to get the job done,” I had to go and answer the specific questions I needed answered first, along the way, putting together the pieces of a very complex jigsaw puzzle, if I was ever going to answer the biggest question of them all.

That question, and as far as I'm concerned it is the biggie, was this: Is it possible—in theory, or more importantly, in practice (and if so, more to the point, how)—to pinpoint in advance, the smallest intervention into any system that will trigger a flip from the existing state of the system to any other possible state of the system?

DF: That sounds like a pretty arcane question.

JW: Arcane? There's no question in the world more practical! Think about it. If you could answer that question in the affirmative, and work out the "how" part, then it would be possible to pinpoint the smallest intervention, in any situation, to transform the existing state-of-affairs into the desired state-of-affairs. Come on, you can't get less arcane or more practical than that!

DF: All right, so you go and spend decades in dedicated scientific research, and you have to admit the research itself was in some pretty arcane fields of science, from the layman's point of view, anyway—semiotics and cybernetics are hardly household names! So after all that, did you find the answer you were looking for?

JW: Eventually. But you've got to remember—you said "fields of science." Apart from the empirical side, I needed, concurrently, to rigorously excavate the philosophical foundations of change, through fundamental investigations in philosophical logic, philosophy of language, philosophy of mind, epistemology, philosophy of science, and related fields—because all of this work together soon acquired a single-minded, explicit aim. That aim was to explore the conceptual and empirical implications of a radical new approach to understanding the very nature and dynamics of change.

The results, as you know, were set out in my theoretical treatise, *Principia Metamorphologica* (based in turn on my doctoral thesis), which I withdrew from Oxford University Press just before it was to be sent out for peer review, because I spotted an error in it. There was an unintended ambiguity in my use of a fundamental, deliberately undefined term, and one that sounds innocent enough: the word was "item." As I worked to put that troublesome ambiguity to rights, I started digging deeper at that spot, and there opened up before me a rich new vein of theoretical development I'd never suspected was there. The treatise quadrupled in size as a consequence, and has delayed publication by over a decade so far, but I at last had what I'd been looking for from the beginning.

And the upshot is that this way of understanding change turned out to require what was tantamount to a radically revised view of the very fabric of reality—not to put too fine a point on it.

DF: Let's cut to the chase then. What have you been doing along with your Interchange think-tank colleagues to explore the practical implications of this new view?

JW: Along the way, while the research has been proceeding, we've been developing powerful, practical applications for resolving major issues in the world of affairs through precisely pinpointed minimalist interventions—that is, actions precision-engineered for the purpose, which is the practical upshot of all this theory. But it's hard to make sense of the practical consequences without understanding at least a little of where my colleagues and I have had to depart from the conventional, "commonsense" view of reality.

The conventional view of reality

DF: *So what is it that's so different about your conception of reality?*

JW: OK. Let me try and keep this brief. On the conventional view of reality, there is on the one hand, the way things are—how the world is. And on the other hand, there's the picture in our heads of how things are: our perceptions and misperceptions, conceptions and misconceptions of the world. According to such a view, we progressively construct an ever more complete, ever more accurate picture—in our heads so to speak—of the unified, determinate, given world—typically thought of as being outside our heads—building up ever better models of how things are, and how it all fits together into some kind of a system.

DF: *That's probably how most people, at least those who bother to even think about it, think about reality.*

JW: Agreed. Now, on one variant of this view, as our knowledge of the world progresses, our perceptions, conceptions and models of reality come to correspond ever more closely to how things really are.

But on a second, dissenting variant, we can only construct an ever more coherent model of reality, which we can—at best—*assume* may more closely approximate to its actual workings, but is just more internally consistent and leads to better predictions.

And on a third, closely related, contemporary variant of the conventional view of reality—an influential variant sometimes called “constructivism”—all that we take for reality is held to be, after all, just a kind of virtual reality in the first place, as it were a simulation in our heads. Just a function of how our brains have been wired. So this third, “constructivist” variant (really little more than a noisier, more rhetorically strident rendition of the second, “coherentist” variant) holds that since we cannot ever sensibly talk about, let alone fathom, how things really are in themselves, because we can never get beyond the world inside our skulls—think of that movie *The Matrix* where brains are stimulated to evoke a surrogate, virtual world—we can at best just hope for an ever more cohesive, more adequate overall construction or model of reality. The constructivists hold that the best we can ever do is construct a surrogate world that works more satisfyingly for us—a more practicable virtual world—for they think that, strictly speaking, that's all there is.

And so where the first two “realist” variants put reality out there and quite separate from our pictures and models in our heads, this third, constructivist version of the conventional view puts it all in our heads. They hold that reality itself is ultimately only here in our heads in the first place; that is, we have a picture or model that is not, strictly speaking, a model *of* anything we can ever say anything about. They reckon that what we take for reality itself is just a kind of working model we've constructed—but that it's all we have, and we can simply try and reconstruct it as we will, with better or worse consequences, working it into an ever more cohesive and practicable system.

An alternative view of reality

DF: I'll stop you now by saying that's all very interesting, but it sounds a lot like debating about how many angels can dance on the head of a pin. Also, you called all three of these views "variants of the conventional view" of reality, which implies you are contrasting the conventional view with the view you've come to hold.

JW: Absolutely right, on both counts. First, yes it does sound like debating about angels dancing on pinheads. Totally. In fact, despite the vast philosophical literature comprising centuries of debate between these three views and despite the supposedly great differences between them, still from my perspective, quite frankly, the differences are too trivial to be worth bothering about. For all three agree on the essential points, which is where my colleagues and I have found them all to go wrong.

You see, my own view of reality breaks radically from all three variants of the conventional view insofar as, for one thing, our own view puts reality as well as our perceptions and conceptions of it all out there, outside our heads. It's *all* out there! The way you take things to be is something out there in the world, not in your head at all! Why on earth did anyone ever think it was? It is the territory-as-mapped-by-you, but a part of the real-world territory itself for all that. Your mapping is necessarily incomplete, only highlighting selected aspects of things while ignoring others, and may be wrong in some details, but it's out there all the same, and—importantly—objectively verifiable.

DF: So our own, subjective view of things is objectively verifiable, but incomplete; the truth and nothing but the truth, but not the whole truth. It's out there, a piece of the real world, not in our heads, but only a piece of what's out there? Is that right? And if so, so what?

JW: You put it very well. The truth and nothing but the truth, but importantly, not the whole truth. Exactly. But let's look at the "so what?" Because it's a whacking great big "so what."

Consider anything we're disposed to refer to as "the situation" or "our situation." Our situation is never a given, but is how we currently situate ourselves, in relation to the factors we deem relevant to achieving our ends, and the resources we believe to be at our disposal. Nor is it simply our own private construction. Not at all. It's real enough, and in itself it's entirely independent of how we choose to think about things. Our subjective reality, our perception of reality, our conception of it, is not in our heads at all but is objectively out there with the rest of the objective world. It's a real live piece of it, which is why it seems so real to us at the time. You can touch it and feel it and observe it; you can count it and measure it.

All the same, your perception and conception of the world, objectively verifiable and real—part of our shared, public, non-negotiable reality—is still no more than a more-or-less arbitrarily selected subset of the rich, infinite possibilities out there in objective reality. Since the subjective realm is a selection from, a subset of, the objective world, it can be—and for the most part usually is—quite objective for all that, though, mind you, that objectivity won't buy you much! All that objectivity and two bucks and a quarter will buy you a ride on the New York subway. For—and here's a big piece of the "so what"—even our most accurate, objectively valid conceptions and perceptions of how things are may nonetheless be quite irrelevant and misleading, even dangerously wrong.

DF: Whew—that's a lot to take in. Can you just briefly recap your proposed alternative to the conventional view of reality?

JW: Sure. First, my view of reality rejects the conventional subjective/objective dichotomy and puts our subjective perceptions and conceptions of things out there in the world, open to view and objective verification for what it's worth (which turns out to be: not much). This account regards our take on the world as being a limited—and often unduly limiting—subset of how things actually are, where both the possibilities and the constraints are infinitely richer than in our limited conceptions of them.

Now that recaps what I've said so far, but it's only one aspect of our alternative conception of reality.

More importantly, at the same time—on our view—reality has, and can have, no unitary coherence. There is nowhere our various accurate descriptions of the world all come home to roost. Reality can never be validly—or even reliably—represented in a nice, tidy, stable, unified picture, whether now or “one day.” To put it bluntly: There is no “the way things are.” There just is no “how the world is,” whether given or constructed. There cannot be, even in theory. If you like, there is no one “reality.” There ain't no such animal.

Instead there are an infinity of mutually irrelevant and only coincidentally connected *ways* things are, shifting constantly in response to the questions we happen to ask about how things are. Change the question and you change “how it is”—sometimes radically.

DF: Does that mean that we can never comprehend reality, and that any laws or generalizations which would purport to describe “reality” in a comprehensive manner can't be believed, because reality literally changes as we change our point of view, a sort of Heisenberg Principle as related to reality?

JW: No, not exactly. On our revised view, we see reality as no more than the sum total of what can be regarded, on objective criteria, to be “real,” objectively valid. And so, for us, reality is at best a random miscellany, comprised merely of the objectively right answers to whatever questions we have happened so far to ask. Reality is a creature of inquiry, a by-product of the questions we ask and answer. And the answers, like the questions, can take an infinity of different and utterly unrelated forms, and need have nothing to do with one another—and, for the most part, do not.

An explanation is whatever succeeds in explaining something to someone, removing some puzzlement about “why this, as opposed to that.” And just about anything can serve as an explanation—contrary to the age-old prejudice amongst philosophers that all explanations must ultimately take the same form, and must all join up into one great explanatory framework. Utter fantasy, grounded in nothing!

But to come back to your question: No, we can indeed—absolutely, positively—come to know how things “really” are in the world outside our heads, the reality behind appearances, but only in respect of any one, given specific question at a time. However—and this is key—we mustn't expect it all to fit together into a coherent whole, ever, (never, ever, ever!) because—guess what—in reality, it doesn't. It doesn't and it can't, as a point of logic. Not in any possible world.

DF I think I get it. It will never be possible to weave those right answers to our questions into a coherent whole. So “reality” is just the sum total, as you say, of what is “real,” which is just what is the case with respect to the questions we've asked so far?

JW: Yes, precisely, it's just an abstraction from the answers to our questions, and they don't join up, not even “at the back”! There's no unified realm where all the answers fit neatly together into some kind of a system man progressively reveals. There's no “City of Truth” as the medievals thought of it. You

might say too that we sort of get the reality we deserve, according to the questions we've chosen to ask, or more to the point, have failed to ask, because if we haven't asked the questions, we won't have those answers and reality will be correspondingly impoverished compared to what it would have been, had we asked those questions. But what's worse, and here's where the shoe really pinches, most of the time we ask the wrong questions.

For example, I was trying to get from Union Station in Washington, DC to a meeting in Alexandria, Virginia and I asked about the times of the Amtrak trains and got the right answer, absolutely the correct answer; so I nearly cancelled the whole trip since there were only a couple of trains a day at very inconvenient times and I'd be marooned in the middle of Virginia somewhere, I figured. What the hell did I know? I know London. I know New York. I know Oxford. But I'd asked the wrong question. Fortunately, I was eventually spurred to ask the *right* question when someone naively questioned me, "well why d'you wanna take a train anyway, of all things?" "Well wha'da'ya mean?" If I'd asked how to get to Alexandria by public transport I would have been told at once that there's a fast Metro running there every few minutes, back and forth. Alexandria's only a few subway stops away.

Reality is the sum total of what's real—all the right answers to the questions we've so far thought to ask, and those questions are a creature of our particular purposes in asking. Like our purposes, our questions—and in turn, reality—are inexhaustible; and what appears to be real ("No way to get a train to Alexandria at the times I need to go") may only be a deceptive distraction. Plenty of Metros, guy. Get real.

DF: So you do away entirely with the notion of a fixed, coherent, unitary world with which we have to deal, and you replace it with what?

JW: We replace it with the notion of reality as infinitely multi-dimensional and entirely question-relative, a creature of our various inquiries, never forming any kind of a cohesive system, even for an instant.

DW: Thank you—that's the summary, the recap, I was looking for. Now I'd like to move on.

JW: Me too, but not so fast, I'm afraid. It gets worse again. Way worse. For on our new view of reality, the world is also, therefore, "a symposium of points of view," to borrow Eddington's apt phrase. For there will at any instant be a quite different, equally objective reality corresponding to each of an infinity of different points of view, in respect of each and every distinct question that can be asked.

DW: Does that mean "anything goes," depending on your point of view?

JW: No, not at all! In fact, our account leaves no room at all for any form of relativism—this is taken care of by the strict question-relativity of all assertions and by our own set of more severely demanding criteria for the truth of any assertion. You see, in the first place . . .

The "museum theory," techniques and expertise

DF: Hold on a second. If I am following all of this correctly, then on your view of reality, my own perceptions of "how things are"—call it my own "Little Reality"—are, in fact, a very real, objective, publicly verifiable part of the "Big Reality,"

because I've selected them from the menu offered by Big Reality. So, does everything in what I'm calling my "Little Reality" just depend upon how I look at things? Are there no rules or laws that govern how things are or how things work?

JW: That's an interesting question, but one that sounds to me (forgive me) as if it is still mired in the conventional view of reality; and it can only be asked from within that view. I recall you referred earlier too, in one of your questions, to laws and generalizations, and I think you asked whether all this means we can never say anything at any level of generality, and I never quite got around to answering you. It's not that there are no laws describing "reality," no invariant patterns (of course there are); and it's not that we cannot generalize validly (clearly we often do), but rather that the desire to categorize and label every aspect of our reality and try and make it all fit together into some kind of a unified whole—a system posited as constituting the underlying structure of what we're dealing with—is the very impulse that leads to problems in the first place.

DF: *Can you try that again? I'm not sure exactly what you're getting at.*

JW: I don't think I put that very well, but let me un-garble that for you. Hopefully not just re-garble it. You see, the conventional view not only posits a systemic reality (given or constructed)—a determinate, unitary, law-governed, hierarchical cosmos of wheels within wheels—"nature," "the world"—but the conventional view posits a world in which there are supposedly to be found various fixed classes of phenomena, hierarchically related: biological phenomena, and the phenomena "of" ("belonging to") geophysics or quantum mechanics or psychology or economics or accounting, and so on and on. As if all of reality, including human life and all our human engagements, and everything with which scientists or civil servants or managers have to deal, came ready divided-up into fields, corresponding to the well-worn classifications used in dividing up (say) university departments, the labels on corporate organization-trees and standard industry classifications, and so on—like the signs on supermarket aisles or department store floor guides or what have you. According to this conventional "museum theory" of reality, everything bears or could bear a label stating what sort of thing it is, what class of phenomena it belongs to, what department it therefore belongs in, and so which specialty and set of expert tools is required to deal adequately with it.

DF: *But hang on, I don't call a plumber if a fuse blows and my lights go out. I call the right expert for the job, the one who knows the answers to the sorts of questions I want to answer. Why is the use of labels and categories so inherently limiting? Don't they help us deal more effectively with the perceptual bombardment by which we are assaulted every minute of our waking lives? This approach generally works, doesn't it? It gave us the Yellow Pages, for a start.*

JW: Sure it works, but only up to a point. What if your fuse only blew because an RCD [residual current detector] was thrown when water from a leaking pipe started dripping on an electrical connection? Or what if it wasn't dripping from a leaking pipe but from a roof tile that was dislodged, letting rainwater in? You'd need a roofer, not a plumber, let alone an electrician.

But let's back up a step: Any given aspect of anything, on the conventional view, is supposed to be addressed with the appropriate class of specialist knowledge couched in generic techniques and principles, each based on an understanding of the cause-and-effect relationships found to obtain in that particular domain. This only means that each class of problems has already been implicitly defined as the class of problems amenable to a given class of known generic technical solutions: "This is a financial problem, a marketing communications problem, an engineering problem, a culture-change issue, a strategic issue, an operational re-engineering problem"—and so we name our complaints after our favorite remedies. This

change to be brought about is essentially a change of type “X,” that is, the type that is achieved by using the available “X”-tools.

DF: *What’s that old saying about experts? “If your only tool is a hammer, you treat everything as if it were a nail.”*

JW: Sure, but it’s even worse than that, because, as I like to point out, the more tools you have in your toolbox, the more this error is only compounded!

DF: *Wonderful. But a scary thought too!*

JW: It’s as scary as it gets. Nowhere does this “museum theory” of reality operate more insidiously and destructively than in practical affairs where we glibly bandy about our favored mid-level abstractions—as if we were talking about something real. Yet, if I’m right, it turns out that, fortunately or unfortunately, the whole “museum theory” of reality is no more than a fairy tale, and in fact a dangerously limiting one.

DF: *What fairy tale are you thinking of? The Emperor’s New Clothes?*

JW: That’s the one! And it’s scary precisely because who would second-guess the experts? The Emperor’s New Clothes indeed! Experts only know what they know, and no more.

A lovely story comes down to us from Pliny the Elder about the painter Apelles, fourth century B.C.E., in which a certain “expert,” a passing cobbler, pointed out correctly that Apelles had made an error in his depiction of a shoe-latchet in one of his paintings. Well, Apelles gracefully accepted the criticism and swiftly rectified the fault with a few deft brushstrokes, whereupon the cobbler went on to criticize the way Apelles had painted the wearer’s legs! The indignant Apelles rebuked him with the immortal words, “Cobbler, do not judge above the sandal!”

The cobbler’s expertise made him competent to judge of the anatomy of sandals, but not the anatomy of anything higher. Yet the expert is irresistibly tempted to extend his presumption of expertise to judge matters superficially adjacent to those in which he can rightly claim to be an expert, even where, as in the case of the legs above the sandals, there’s no legitimate connection beyond, at best, bare propinquity of subject-matter, if you’ll pardon the pun. The expert knows the right answer to the question, but what if it’s the wrong question?

DF: *But again, throw away conventional reality if you must, but what about all the scientific progress of the last few hundred years? Do we throw that away too?*

JW: Rest assured, it’s left quite untouched. Bear in mind, the conventional, superannuated view of reality we reject—this notion of a unified, systemic reality, hierarchically arrayed in classes of phenomena forming the domain of separate disciplines—was not arrived at through a process of scientific discovery! It was simply dreamt up, in pretty much pre-scientific days, by those good old boys in powdered wigs, tricorne hats, knee breeches and frock coats, and by their parents, grandparents and great-grandparents, before we knew even the most insignificant fraction of what we know today.

Yet it remains the official Reality, the one in which almost all of us live and move and have our being—or at least imagine we do. Nor, if the historians of science are to be believed—and their research on this point is by now pretty incontrovertible in my view—the conventional conception of reality contributed “not one jot or tittle” (as they used to say in those days) to any scientific advances. It was quite neutral,

just some charming wallpaper. Science would have been, and is, quite safe without the fairytale illustrated on that wallpaper.

In any case, irrespective of whether we view this reality as given for us to discover, or constructed by us according to how we're wired, this fairytale, bureaucratically-organized reality—a determinate, systemically interconnected, hierarchically-ordered, rule-governed, toolbox-friendly, deterministic universe of matter and energy, object-and-forces, cause-and-effect—is something my colleagues and I have come to jettison altogether in favor of the very different reality we have been laying bare in our philosophical and scientific work. But science can carry on happily, indeed more happily, without the outdated Baroque picture hanging on the wall above the conference table.

From cause-and-effect to flux-and-constraint

DF: Are you saying that science can still trace the laws of cause and effect, one question at a time, without having to buy into the Baroque picture of a unified, hierarchically-ordered City of Truth, as they called it?

JW: Well, not to be too pedantic but it was actually medieval thinkers who called it that, though the powdered-wig brigade, bless their cotton breeches, took up that old and comforting view, or brew, old wine in new bottles, to console themselves after the senseless anarchy of the Thirty Years' War. Yet for all that, the universe now appears to be more anarchic than orderly, on our conception, although richly veined with pattern all the same.

And as for your reference to cause and effect: my Interchange colleagues and I have come to view reality as a fluid, infinitely multi-dimensional world of endless possibilities, an indeterminate and undetermined, fundamentally anarchic and constantly shifting kaleidoscopic universe of form and pattern, flux and constraint, which even in its most idiosyncratic local details is susceptible of rigorous scientific analysis and which is ultimately pliable to our will. For another 17th- and 18th-Century notion, a Baroque invention we have had to abandon as misleading and unnecessary—whether in science or in everyday life—is the conventional modern notion (400-years old and out of date), the notion of *cause-and-effect*, and again irrespective of whether you are talking about lineal causality or circular causal loops. We replace cause-and-effect with the notion of flux-and-constraint.

DF: Should I assume, then, if the notion of cause-and-effect is to be abandoned, that on your view of reality, when I hit my finger with a hammer when trying to pound a tack into a wall to hang a picture, the smash of the hammer doesn't cause the pain in my finger?

JW: No, not saying that at all, nor would the explanation likely be much different in your example. But once again I have to take a step backward so I can put this into perspective.

The conventional view just assumes, tacitly, that persistence is always the status quo. So any change needs to be accounted for in terms of specific causes, and therefore just assumes that any desired change must be brought about by somehow causing that change. That's the picture we discard. Instead, on our own "photographic negative" or figure-ground reversal of the conventional picture, we hold that, all things being equal, we are entitled to expect continuous, random flux everywhere; and the persistence of any particular order or pattern is thus viewed as highly improbable, and it's this persistence that needs accounting for. This would include situations like your hammer-smash, finger-pain example.

From this perspective, persistence presupposes mechanism. And so any scientific inquiry aims to throw light on the mechanism that accounts for the persistence of any descriptive invariance—any pattern. Order or invariance—pattern—we view as a function of “constraint,” which is a technical term from cybernetics referring to a particular relation between two sets of possibilities, where only a subset of some wider set of theoretical possibilities are currently realized.

DF: I'm not sure I follow that.

JW: Look, if there were ceaseless, unconstrained, random flux, there would be a far wider set of possibilities that might now be realized just here, yet only a small subset of the logical possibilities are actual, given the constraints in place. Our inquiry is therefore aimed at revealing the nature of these empirical constraints. This type of inquiry can be applied in any situation, including your picture-hanging accident, but the differences there would be fairly trivial—not so in more complex cases requiring explanation and intervention.

The idiosyncrasy of constraints and releasing change

DF: Isn't this just a matter of semantics?

JW: Well, it is semantics, but unbelievably powerful and important semantics, especially when the inquiry involves a situation more complex than your hammer and painful finger.

Here's the thing: in any situation, the constraints may include certain universal, empirically established patterns or invariances, including of course the most overarching ones of all, normally referred to as "laws of nature" or of physics (e.g. that light cannot travel faster than C); these may be sufficient to explain your finger pain.

But in more complex real-world situations, our inquiry need not stop there, with laws of nature, etc.—far from it! We needn't confine ourselves to citing only such universal invariances as happen to apply. Because in specifying more fully the set of constraints-on-variance that preclude all states of affairs other than the one we are seeking to account for, we can go on to specify the far more numerous sources of constraint which are not universal at all, but which are quite concrete local constraints, idiosyncratic to the specific situation. For example, it is not a law of nature that prevents me from getting down to Wall Street by 2:00 p.m., it's the cancelled subway train and the traffic in the streets on this rainy New York day.

DF: Would you seek to express things in such terms—in terms of the idiosyncratic constraints—in any and every scientific inquiry, or only in analyzing practical situations scientifically?

JW: On our revised view, our new question-relative epistemology of form-and-pattern, flux-and-constraint, no scientific explanation is to be regarded as complete until we can satisfy the questioner's quite specific "why this rather than that."

If I am in the front quad at my college in Oxford, talking to the Professor of Neurophysiology, and we both see the Politics don running out of the front gate like a bat out of hell, and the neurophysiologist asks me, "Why is John running?" then any answer I try and give in terms of nerve cells firing in his brain and

muscles contracting and so on will be regarded as an irritating joke—the Professor of Neurophysiology of course knows all that already. The right answer may be, “To catch the last post,” or “the Headington bus leaves in two minutes and he is already late for tea.” Reductionist approaches rooted in the old epistemology tend to miss this point when they think they can explain behavior in terms of nerve-cell firings.

DF: We're getting off track again—can you go back to what you were saying about idiosyncratic constraints?

JW: I'm actually still in the middle of saying it: So, to satisfy a questioner's specific "why this rather than that," we shall find it essential to specify constraints which may be idiosyncratic to this particular context. Any state-of-affairs is from now, on our new epistemology, only regarded as having been accounted for scientifically when it can be demonstrated to be the only state-of-affairs not currently precluded by the constraints enumerated; and we must rigorously demonstrate how nothing other than what obtains locally is currently possible given the constraints in place.

When explanation is couched in the negative terms of flux-and-constraint rather than in the positive terms of cause-and-effect, it becomes possible to apply scientific rigor to the analysis of completely idiosyncratic, one-off situations, like the ones you deal with every day. And here an analysis in terms of flux-and-constraint becomes indispensable.

DF: Can you say more about why?

JW: Sure. We must ask such negative questions as, “What *stops* this happening?” and “How is it that the current state-of-affairs is the *only* state-of-affairs *not currently prevented?*”

You see where this is going: Change, from this perspective, is never caused, or “brought about,” nor need it be. Desired change needs merely to be released, by pinpointing the specific, idiosyncratic constraints which need to be lifted and/or inserted so that, in place of the existing state-of-affairs, the desired state-of-affairs is *now* the only state-of-affairs not precluded, given the new sets of constraints put in place; and the constraints identified will be as local and idiosyncratic to the situation as you please.

DF: Is this what makes it possible to rapidly catalyze large-scale transformations with very small interventions?

JW: Precisely. Since any desired state-of-affairs is viewed as already inherent in the existing state-of-affairs and needs merely to be released by carefully removing and inserting constraints, it follows that major transformations can be achieved all at once, in an all-or-none flip from the existing state-of-affairs to the desired state-of-affairs. You shift the configuration of constraints so that the old state-of-affairs is rendered impossible and so that now the new one is the only one possible—it just flips over accordingly.

In fact it is possible to demonstrate—not only in theory (as we have done in our philosophical work) but also in practice (as we have done extensively in our applied scientific work)—that in principle change does not take time, and need not take time in practice. What typically does take time are the longwinded, clumsy ways people normally, habitually attempt to “bring about” or “cause” change, rather than simply pinpointing, releasing and channeling the possibilities that are already there. To paraphrase an old NATO training manual, just because it's possible, with enough determination, dexterity and ingenuity, to push a pea up the side of a mountain with your nose does not mean that that is a sensible way of getting it there, or that delivering the pea to the peak is the only or even best way of achieving your objective.

DF: A bit worrisome, isn't it, that our own troops needed to be told that! I'd rather it was the training manual for the bad guys.

JW: Well, actually, it was our NATO computer-programming experts who needed to be told. But yes, worrisome all the same! Still, they're experts, and the sharp-nosed pea-shifters just kept pushing up the mountainside, one more push of the pea and we'll be home by Christmas. Once again it's like Pliny's cobbler moving on from opining on shoe-latchets to opining on how the greatest painter of the day should portray his models' legs. The programmers knew how to push peas.

Now, from this perspective too, we can see that any generalized solution to a generalized class of problems (the usual sorts of solution) will on its own typically fail to deal with the only sets of constraints that in point of fact necessarily preclude the desired state-of-affairs—the local, idiosyncratic ones, within which any effective solution must be designed in any case.

This is also why, when the general solution fails for just this reason, or takes great effort to shoehorn into place, this is normally seen as being no fault of the solution itself—just some local interference, or “implementation issues”—and so any number of such failures and any amount of delay and difficulty in implementation is never enough to discredit the general solutions themselves, which haplessly we still try and finesse, force-fit or even hammer into place by force.

The limitations of maps and models

DF: Again, do you mean to imply, as you seem to be implying, that there is no such thing as a general solution to any type of problem? If that's the case, why do organizations invest so much money paying for consultants to bring their canned solutions in to solve the organization's problems?

JW: Sure, there are plenty of effective general solutions to types of problem, but they're never optimal solutions, and as often as not involve a massive waste of time and resources, though some of the time this may not matter. I think it was Bertrand Russell who said that fully nine-tenths of the world's business is pointless lunacy in the cause of general employment. But more broadly, your question gets to the heart of the matter, since, once again—and it's easily done—you've fallen into the common trap of describing both problems and solutions as falling into categories or types, rather than being singular, idiosyncratic situations that may or may not bear any relationship to anything that has come before or since.

Reality, on our revised view—this fluid, anarchic, infinitely multidimensional world of local, idiosyncratic form and pattern, where cause-and-effect is replaced by flux-and constraint—is a world of endless possibilities which are all too easily obscured by blurry yet concrete-sounding, mid-level abstractions, rigid models, and the search for generic technical solutions couched in terms of these limiting models and metaphors.

DF: How so?

JW: People tend to operate consciously or unconsciously according to more-or-less crude, fairly rigid metaphors for what they are dealing with, in order to help them get a handle on an infinitely multi-dimensional, constantly shifting situation. However, every metaphor breaks down somewhere, or else it would not be a metaphor at all—it would be a strictly literal description! And the options available to us

are limited by the very limitations built into the more-or-less arbitrarily adopted metaphor; so people tend to get stuck in their own chosen metaphors, blinded to all the possibilities obscured by the metaphor.

DF: Sounds disarmingly familiar . . .

JW: Sure it does—in fact, most approaches to managing complexity, from managers’ natural, everyday intuitive, commonsense approaches to the most sophisticated, arcane ‘systems’ approaches (with or without fancy charts with loops and boxes and arrows, or even computer simulations), attempt to address the complexity of situations by constructing ultimately *ad hoc* maps or models of what we are dealing with, introducing various simplifying assumptions along the way.

DF: But isn't it true that models at least help us understand complex situations?

JW: No it isn’t, because the model depicts only observable, recognizable descriptive features of the original along with the connections and/or relationships posited or observed to hold between them. In contrast with any truly scientific approach, unobserved features of the situation are not depicted in the map or model, and the models constructed are primarily descriptive rather than explanatory.

Such a model—the usual sort in management—is, therefore, merely a simplified representation, a mere re-description that retains some features of the original while deliberately omitting others.

In explaining all this, Dr D. J. Stewart years ago illustrated the point with the example of a model ship. The model ship is like the real one, he points out, in much of its structure and therefore in the relationship between its various parts, but it’s of a different size, is made of different materials, and so on. A model of a ship will require certain features to be discarded but not others if one is interested in modelling its flotation properties, but a totally different selection will be required if it is intended to show the location of the different cabins on the various decks. Here’s the bridge; this is the engine room. Of course, we incorporate into our model all kinds of features which are neither permanent nor necessary in reality, and which are themselves already dysfunctional; and once enshrined in our model we tend to treat them as semi-permanent fixtures. For we treat all the elements in the model as equally real, part of the territory we are navigating.

DF: What exactly do you mean by that?

JW: Well, for example, you sometimes still see signs in England above sinks in public restrooms saying, “CAUTION, EXTREMELY HOT WATER—DANGER OF SCALDING.” Used to see them at Heathrow! Recently. Some years ago we had one—you’ll love this story—in the basement of the medieval building in Oxford where I teach. Beautiful plaque with nice graphic design. A very traditional English sign, with the traditional English wording. In everyone’s mental model of the College, there was a restroom, and in the restroom was a sink with taps, and in the taps was extremely hot water, clearly labelled as such. I told them that unless they wanted to put the warning sign in every language under the sun or get sued as well as massively fined for violating Health and Safety regs, shouldn’t they just adjust the boiler temperature down? Which they did right away, as soon as I pointed it out, and they duly took down the sign. Took less than one minute, apparently—to order the sign took them a week, and had been up there for as long as anyone could remember. Probably took longer to take down the sign than to fix the problem it warned you about. But the problem had meanwhile already become a fixture, part of the wallpaper no one noticed any more, nothing that could be addressed, only labelled, and it was labelled in a way that presupposed it could not be addressed.

But before you sneer, I bet you do this all the time yourself. I know *I* do. We all do. No one had ever asked, “how do we keep the water from getting so hot?” They asked, “how can we get people to exercise caution so they don’t scald themselves here, with this very hot water?” They assumed there was nothing they could do about it. “Different department.” The maintenance people assumed it was fine as it was, or else they’d have been asked to adjust the temperature, since that’s so easy; but apparently the people in charge preferred it the way it was because they put up that beautiful expensive sign instead. So the Oxford dons on the maintenance committee years ago, the ones who ordered the sign, some of the world’s most brilliant minds, may have made the mistake of thinking, “Look, the reality is that someone’s sooner or later going to scald themselves if they’re not careful, so we’d better warn them so they can’t say they weren’t warned!” Wrong reality. Bad models can short-circuit even the best minds.

But what I was saying is that if you build a model ship, there’s a way to build that model if what you’re trying to show is where the engine room is and where’s the bridge, and the lifeboats and whatnot. But that’s all the model can do for you in that case. Show what’s where. It can only answer that one question, “where is what?”

DF: There’s nothing wrong with that. It’s just being pragmatic.

JW: Of course there’s nothing wrong with it, but the choice of which features or properties of the original to retain and which to discard as irrelevant is entirely a function of the use to which the model is to be put, and so entirely a function of the question you are asking. The properties relevant to your particular question are retained, while those deemed irrelevant or immaterial, are not represented in the simplified model. As I said, you’ll need quite different features to be discarded and retained if what you want to model is the ship’s flotation properties—a model showing the bridge and janitor’s closet probably won’t help you. But in the modelling process, Stewart emphasized, what is most important is the selection of which properties to leave out. All of these considerations are particularly evident in those models intended to serve as maps to help one find one’s way around the territory. Like the map of the New York subway.

DF: You make it sound like we should never use models to help us understand complex situations. Is there ever a place for models when dealing with complex problems?

JW: Sure. Nuclear reactors, for one. Look: As with the use of unwitting metaphors, maps or models limit our choice of action to the options available within the surrogate world of the model constructed. Imagine trying to find your way around any major city on foot using only a subway map!

The infinite range of possibilities for intervention is restricted to the infinitesimally small fraction of possibilities that are represented in the model. What happens is that all the rich, granular detail—which is where, we have learned, the optimal solutions are invariably to be found—gets lost in favor of the few rigid sets of possibilities offered by the interconnected abstractions constituting the model or map, which only fudges the real issues. It lulls us into a false sense of understanding what’s going on. When the model-builders try to put some practical situation into a nutshell they typically end up with nothing more than, well, . . . the nutshell!

DF: So I gather then, that making the models and maps more detailed and complex is not going to help either?

JW: It will neither help nor hurt—it's simply irrelevant. It's just rearranging the deck chairs on the naval architect's proposed *design for* the Titanic. And apparently with the Titanic the problem was that they failed to specify the rivets in sufficient detail, including where they were to be sourced from—so the shipbuilders ended up using a cheap lot of substandard imported fastenings that just sheared, weren't up to the job. The hull shouldn't have split when the ship hit the iceberg. The ship's design was robust enough to take it, but only if that design had included a specification of the manufacturing standard for the rivets—using “No. 4-bar” iron as opposed to “No. 3-bar,” and using techniques that only the largest, most experienced forges were capable of, whereas the rivets were sourced from small, mom-and-pop-shop forges. In short, the naval architect's model left out some key design features that should have been carefully specified. The devil turned out to be in the granular details. Like in the old proverb about the battle being lost “for want of a nail” in the horse's shoe.

Anyway, so whether the maps seem almost as complex as the situations being modelled, or hopelessly over-simple and reductionistic, either way, they simply compound the scientifically naive errors of everyday life. After all, we get stuck in situations when the otherwise useful abstractions we're using are no longer adequate for what we're trying to do.

At the concrete level there are countless latent possibilities, but these get masked by the mid-level abstractions people tend to deploy, and so the real challenge is how to reveal—and realize—those latent possibilities. Nothing's to be gained by plastering over the practical cracks with yet another layer of those fancy, mid-level abstractions.

DF: *So what's a person to do?*

JW: It should be clear by now, given the radical question-relativity and infinite multidimensionality of reality, that from our perspective, any map or model worth its salt will only be suitable to answer one single question; and that as soon as a different question is asked we would need to throw away our model and construct a new one from scratch.

DF: *If that's the case, won't I be spending all of my time doing nothing but constructing new models to help me deal with every new situation I encounter?*

JW: Only if you really enjoy building models. Otherwise, you won't get much for your efforts.

In general, the mapping or model-building approach to managing complexity is valuable only if the real thing is too dangerous or too fragile to mess around with—nuclear reactors, as I said earlier—or has not been built yet (ditto—try building one, or any complex structure, without one). Otherwise, though, it is more appropriate and useful to operate directly upon the real world, for instead of constructing analogical models of complex practical situations, we can filter the complexity out of the equation in a non-reductionistic way.

Instead of keeping reality at a distance by working with the surrogate reality afforded by maps and models and mid-level abstractions, my scientific colleagues and I choose “to work directly with pieces of the real world in a close and delicate manner,” as Stewart likes to put it.

The fabric of reality

DF: Can you elaborate a bit on how you “...work directly with pieces of the real world in a close and delicate fashion?”

JW: For me that’s the really exciting bit. Basically, on our revised perspective, the real world is not a fixed piece of clockwork, with wheels within wheels, susceptible to being represented in a diagrammatic model, but the ceaselessly shifting, highly patterned, kaleidoscopic reflection of the anarchic interaction of a myriad of independent agents purposefully pursuing countless agendas of their own, each necessarily addressing only their own subjective reality selected from their own point of view from amongst the numberless objective possibilities out there.

So this “fabric of reality” as I am calling it, turns out to have something of a quite specific logical structure to it—or at least we can readily analyze the world in terms of such a structure—a peculiar, contingent structure. I say “contingent” because reality might have had a different logical structure had the universe been made differently, but it appears it doesn’t happen to.

For example, if God had made it that way, the world might have been structured in terms of matter and energy, objects and forces, in the way of conventional reductionist materialism (the view we reject). Or alternatively, reality might have been structured instead in terms of objects and relationships, as it is understood to operate in most systems approaches, where the systemic relationships are considered to be as fundamental to the fabric of reality as the objects so related, and where the world is ultimately to be understood as a function of the non-reductionistic laws governing such systemic relationships, from ecosystems and organizations and everyday life right down to the sub-atomic level (a perspective which seems to be slowly, gradually ousting the received view). My own work, though it certainly had its roots in such systems approaches, eventually took a somewhat different turn, along the same lines but at once more radical and more specific.

DF: OK, but you’ve simply used a different reference frame to describe the reality you work on. Tell me more about the “how” of your work.

JW: In our own mode or idiom of scientific analysis, we analyze anything in the natural world—including not just the biological but even the physical aspects, and of course the social and psychological aspects of the world, not least the world of affairs—in terms of a particular contingent logical structure which we apply to the world like a kind of calculus or template.

DF: Whoa! Why is that template you say you apply to the world not just yet another general model of the kind whose validity you reject?

JW: Fair point. I haven’t explained. The kind of everyday models we reject, the kind so prevalent in the social sciences and especially in management, are just re-descriptions of more or less unfamiliar matters into familiar terms. People describe something, insert the word “because,” and then describe it again, thinking they’ve now explained it. And worse yet, they refer back to their re-description as a map to figure out what to do in all kinds of different situations, using the same model over and over again, consulting it like an oracle. So the models we reject are multipurpose in this way, and they attempt to explain unfamiliar matters by translating them into comfortingly familiar terms.

By contrast, truly scientific models explain familiar matters by translating them into unfamiliar terms, and the models are actually very simple and answer only a very restricted set of questions—for example, like

the “rectilinear propagation of light” in physics, the model of light as moving in straight lines, which when it was first propounded sounded like a bizarre, fantastic notion! Lines of light? You must be joking! I don’t see any lines—surely light is all-pervasive, like space! But while that scientific model explained a host of otherwise puzzling phenomena, like why my shadow is shortest at noon, and so on, still other models were required to answer other questions about light, say in regard to the phenomena seen in rainbows and prisms. In our own work we do indeed use a great many scientific models of this kind, which, like the model of the rectilinear propagation of light, are each at a far higher level of abstraction than the mid-level abstractions of commonsense and management models. And each is relatively simple and self-contained, like virtually all scientific models.

DF: How, then, do you use these templates, or models in your work?

JW: All of the scientific models that we deploy slot into an overall paradigm or template, in which we are only interested in certain highly abstracted aspects of situations—the interactional and communication patterns, and so on—analyzed in terms of particular logical units of analysis. That template enables us to cut through the mid-level abstractions to what is going on at a much more fundamental level. By the way, this is just the sort of thing that your accountant or attorney does when looking at your affairs through a highly abstract financial or legal template.

Our own template however, is at a higher level of abstraction still. We look at the very fabric of reality in terms of a particular, abstracted logical structure, which we have found extremely powerful in analyzing and accounting for a wide range of phenomena, and which enables us to apply specific scientific models—many drawn from cybernetics and semiotics, for example, as well as from our own theoretical work—to idiosyncratic situations, each such component model enabling us to answer different specific questions.

In general, then, the form this template, this contingent logical structure of the fabric of everyday reality, takes, goes something like this: The workings of the world can best be understood as an infinitely multidimensional, fractal pattern of what I call agent-patient dyads, where one element of each pair (the agent) is acting upon another element (the patient—we’re using the old philosophical terminology here for “that which acts” and “that which is acted upon), in such a way as to cancel-out perturbations to some controlled perceptual variable of the agent. For example, . . .

DF: STOP! You’re getting way, way too detailed and complicated here for this conversation. Can you get more practical and bring it back to what you do to “work with pieces of the real world closely and delicately”?

JW: Sorry. Let me just put it this way, then: We have a rigorous way of analyzing the very fabric of what someone, say a manager, is really dealing with when dealing with her “situation,” and we analyze it in terms of the specific, idiosyncratic patterns within this complex fractal structured in such agent-patient dyads. We analyze the constraints that yield the particular patterns observed. These key constraints will mostly take the form of context-markers, the aspects of communication (in the widest sense of the term), that enable each participant to identify at any point which context they are in.

And we are therefore filtering the complex, dynamic communication patterns and loops that make up the rich, idiosyncratic fabric of possibilities and constraints of which that manager’s situation is actually made, the actual and possible constraints and immanent possibilities that will inevitably determine the success or failure of management actions, whether the players are aware of it or not.

This is the very fabric of reality, as it appears on our revised scientific perspective. This is what you are really dealing with every day, at least if you lift the veil of prefabricated abstract categories and models and MBA-speak blinding you to the possibilities for effective action, and blinding you to the very real but unseen idiosyncratic constraints on effective action, and get underneath it all to bring these to the fore. Your everyday reality is, in fact, an extraordinarily complex, indeterminate and ultimately undetermined, infinitely multidimensional, highly patterned sphere in which a kind of anarchy reigns—a kaleidoscopically shifting, protean, multi-dimensional playing-field, consisting of an infinity of perceptions and communications of all the players involved: an infinity of possibilities and an infinity of constraints, most of them local and idiosyncratic, yet all of it now readily amenable to rigorous, scientific analysis and understanding.

DF: Sounds mind-boggling regardless.

JW: Well, it is just this truly mind-boggling reality, which is curiously very much closer to our experience of everyday life than it is to the mid-level abstractions of management-speak, it is this mind-boggling complexity that we address directly in our applied scientific work within organizations—rigorously analyzing it to secure precise, desired outcomes brought about rapidly through the design of precision-engineered minimalist interventions: small communications that flip the entire pattern from the existing, problematic state-of-affairs to the desired state-of-affairs in one fell swoop, by deftly removing and inserting constraints, to catalyze the desired change and lock it in place.

In the practical applications of our methodologies, we get to work directly with pieces of the real world automatically, insofar as we are already sitting in a room with an executive-who-is-dealing-with-a-situation-as-mapped-by-him, and who has access, given the right questions from us, to the details of those idiosyncratic patterns and constraints and possibilities whose significance he would not have been able otherwise to recognize. Remember too, for us there is no line to be drawn between our conceptions and perceptions of the world and the world itself out there, because those conceptions and perceptions of the world are parts of the real-world territory-as-mapped. Likewise, as those conceptions shift in response to our very different questions, the reality shifts. Right before our eyes, right there in the room.

Defining the desired outcome

DF: That sounds almost like magic. And I remember from my time as a client, it sometimes felt like magic. Can you be more specific about the process of asking those questions to pinpoint the minimalist intervention that will flip that reality?

JW: Well, basically, first we have to begin by providing the client—the problem-owner—with expert analytical guidance in defining a desired outcome really worth achieving, in place of the outcome that has initially been framed in terms of unintentionally obfuscating abstractions.

The initial framing of the problem or challenge presented by the client is, in our experience, virtually never relevant to the design of an optimal resolution for achieving the outcome desired. We almost don't care about the problem—it can be a distraction. We're interested in constructing a solution, and an optimally effective solution will never (and I have proved this from first principles), will never ever be relevant to the problem it solves.

If the client's map were of any use—and that's all the presenting problem is, a map of some situation-we-know-not-what-it-is—and the problem-as-presented were really worth thinking about, the client would

have solved it by now. So we choose to ignore it, and not waste time over it. Instead of asking about the problem, we must therefore begin by dispersing a conceptual smokescreen consisting not only of the proffered abstractions embedded in the problem-definition, but also consisting of tacit assumptions and implicit metaphors, maps and models of what's going on, and we begin by clearing all this away, thereby getting down to something real and concrete on which to work, stripped of unnecessary accompaniments, systematically filtering the complexity as we go.

DF: Could you explain the specific process you use for helping the client to define a desired outcome in a bit more detail than that?

JW: Happily. It's an iterative process that, as you well know from your client days, may take up to a couple of hours, in which we deploy our analytical methods to assist the client to do the following:

- first*, to unpack abstractions into their concrete, real-world equivalents, to be described in unambiguous, empirical terms that do not go beyond what could in principle be verified by a video recording with a soundtrack (what we call “video descriptions”);
- second*, to reveal and relegate all operative tacit assumptions, bearing in mind that if an assumption is tacit it does not appear to be (certainly to the person operating from that assumption, and to those who happen to have silently bought into it), doesn't seem to be an assumption at all, but seems, rather, merely to be part of the undeniable, factual furniture of the world. They take it for objective reality itself. Having revealed and relegated these tacit assumptions, we assist the client in eliminating all the now-explicit assumptions clearly seen to be false, and to flag the remaining ones as open to question and testing;
- third*, to reveal and relegate “mental models” of what is going on, what he or she is dealing with, how it works, and what is required to achieve the desired results, along the way again discarding those that can be seen to be mistaken or irrelevant; and finally
- fourth*, to filter the complexity of the situation, defining in precise terms, with clear, verifiable criteria, the outcome actually required, eliminating all the unnecessary “nice-to-haves” and “thought-we-needed-to-haves” and so on.

Filtering complexity instead of mapping it—our own approach to managing complexity—is itself an extremely complex subject, and we have developed a sophisticated, scientific methodology for rapidly filtering the complexity of idiosyncratic, real-world situations without the need for maps or models. Which is important for all the reasons we discussed a few minutes ago—model ships and all that.

DF: So does your approach to filtering complexity emerge naturally from your revised view of reality, as your explanations so far would seem to suggest it would, and if so, how?

JW: Absolutely it does! And the best way to explain this is by considering how we go about creating the “filters” when we are working with an actual client. The client seeks to find a way to get from the existing state-of-affairs to the desired state-of-affairs as swiftly and cost-effectively as possible, with a minimum of risk and without undesired side effects. However, since there is no such thing as “the way

things are,” there is, strictly speaking, no such thing as “the existing state-of-affairs,” except by contrast with the rigorous, concrete video-description of the desired state-of-affairs.

To get a better feel for this idea, imagine that you go for your annual medical check-up and a complete battery of tests, and you ask the doctor at the end of it all to give you a full report on your present physical condition. She is not going to give you an exhaustive descriptive account of every aspect of your anatomy and physiology, is she? Nor is that what you were asking for. She will simply tell you what needs to be put right: “your blood pressure is slightly high, you’re about 7 pounds overweight, and you do need glasses, despite the laser surgery.”

And so it is with “the existing state-of-affairs.” We use the concrete description of the criteria for the desired state-of-affairs as our filter to pinpoint the relevant corresponding aspects of the existing state-of-affairs, how things are now by contrast, and only with respect to this one very specific question. This is a far-from-trivial undertaking, fraught with hazards—I’ll make no bones about it! It is critical that the desired state-of-affairs should be a desired present, *not* a desired future—it’s got to be how events would be “free-falling” right now, today, as we speak, if no intervention were required—and the existing state would be, well, not something static, but an account of the corresponding, highly patterned, current, dynamic free fall—again shorn of tacit assumptions, implicit models and metaphors and blurry abstractions.

Getting from the defined outcome to a designed outcome

DF: All well and good, but it seems that you still haven’t done much, by this point in the analysis, other than to define more carefully what things would be like if the “problem” were resolved. How do you go about resolving that problem situation and actually delivering the desired outcome?

JW: As you rightly point out, all that we have as the fruit of our labors so far—albeit no small thing, and, mind you, rarely optimally achieved naturally without such methods—is a rigorous, scientific description of the precise shift required: a *defined outcome*. But so far, that’s all.

However, as you correctly imply, the really challenging part is then to take this defined outcome and convert it into a precision-engineered, *designed outcome*: one that is ready for immediate implementation in the form of one or a few small, catalytic actions—typically a few precision-designed but otherwise seemingly ordinary, natural communications (a conversation in an elevator, a couple of emails or phone calls, a question put to one or two key executives, or what have you) that’s sufficient to transform the whole situation overnight and shift things sustainably from the existing free fall to the desired free fall, and lock it all in place.

In the first phase of the work I described a moment ago—those four iterative steps to *define* an outcome—the client constructs an objective with expert help from us. By contrast, in this second phase of the work, to *design* that outcome down to the last detail, my colleagues and I now take over: and we design the minimalist intervention itself with help from the client.

So the roles reverse in a way. Before, the client defined the outcome with expert help from us; now, we design that outcome with help from the client, using their expert navigational knowledge of their territory. So from this point onwards it’s our hand on the drafting-pen, not theirs. Sure we rely on the client’s intimate navigational knowledge of the territory, as I said—the organization, business, industry, people,

politics, and so on along with all the most minute, “irrelevant” idiosyncrasies of the place and the players, as well as the client’s own preferred management style and ways of doing things. We have to. For it is the client who will be implementing that intervention and taking full responsibility for it, and it is the client who must convince us that the intervention designed should deliver the goods without risk of mishap; and the client must be 100% confident in implementing the minimalist intervention designed.

DF: It seems like the design of a minimalist intervention to deliver the desired outcome could be a very elaborate process. How do you go about it?

JW: Well, in this second phase of the work—designing the precision-engineered catalytic communications—the filtering process gets even more technical, actually vastly more technical, though only from the analyst’s, not from the client’s point of view. The rich fabric of reality, which I referred to earlier as consisting of an infinity of perceptions and communications of all the players involved, an infinity of possibilities and constraints, again most of them local and idiosyncratic—the whole damn shooting-match is now subjected to rigorous, scientific analysis, which is the form the filtering now takes in this “phase two,” let’s call it. Though I’m artificially separating-out these two phases, which in practice are more intertwined than otherwise.

So this rich fabric—which is, I repeat, precisely what the executive (I mean every executive, everywhere, all the time) is always, always, always really dealing with, beneath all the comforting abstractions—this kind of fractal interference pattern, resulting from the interaction of innumerable perceptual and communication loops, constraints, purposes, agendas, framings, highly patterned flows of information and flows of imparities, and so on, above all consists of a kind of dance of the semiotic context-markers: those aspects of communication that at every point signal to the players what context they are in. Change them or obliterate them and you instantly transform the context.

Like Ali Baba’s wife, when she learned a mark had been placed on Ali Baba’s tent to single him out for assassination, she ran round putting an identical mark on all the other tents. Bingo. It is here, in identifying these context-markers, actual and potential, that we bring to bear a sophisticated, rigorous technical armory—originally derived from cybernetics, complexity theory, semiotics, semantics, the behavioral sciences and a host of other scientific disciplines—using the whole shebang to analyze this rich, kaleidoscopic, multidimensional tapestry, tracing all the salient threads to identify the key ones to pull in order to shift the whole pattern to the desired one.

DF: That sounds fascinating. Can you “lift the hood”, so to speak, and explain how that part of the process works?

JW: I’ll try. This involves a bunch of further steps, again in an iterative fashion:

first, we pinpoint the intervention point (or points) where the right catalytic intervention would flip the whole situation from the existing to the desired state, in one fell swoop, not gradually;

next, we create an initial, broad-brush intervention design, sketching, in principle, the outlines of the minimalist intervention required to catalyze the desired change and lock it in place;

then, we turn that abstract, notional design into a highly detailed, idiosyncratic, high-precision intervention design, taking into account all of the relevant—but at first seemingly irrelevant—idiosyncrasies of the organization, the people, the politics, and so on; and

finally, in collaboration with the client, we co-design a turnkey minimalist intervention, ready for immediate implementation, and delivering within days or weeks an outcome that would otherwise have taken months or years or would have been impossible to achieve at all.

DF: I'm certain that a "turnkey minimalist intervention" is what any of your clients is really hoping for. It's what I was always looking for from my work with Interchange.

JW: That is a critical point. When I say that we design outcomes, I don't mean that we simply produce the equivalent of the architect's elevation drawings—corresponding to what I earlier called helping the client define the desired outcome—one that will meet the client's specification. Nor do I mean merely the architect's blueprints—the pinpointed intervention points and broad-brush intervention design; nor even the detailed construction drawings the builders will work from—the fine-grained, idiosyncratic intervention design.

Rather, I include as well all the fine-tuned changes that in house-building can only be worked out on-site in the course of the builders' work, when, for example, they have to be told by the client that that study door cannot open inwards the way it's being hung, because a potted plant must go in that corner against the wall (nowhere else will it have the right amount of light for that delicate species without blocking the natural light the client needs over her desk, nor can the door be hung from the other side either to open inwards, for such-and-such a reason, etc.), and so it turns out that the builder determines the door cannot currently open outwards either because of certain other constraints he knows about, which therefore means moving a structural bit of the wall, necessitating moving a girder over here, until before you know it, significant changes have had to be made throughout the entire structure of the building! This is the all-important "co-design" step, the very last stage in the process, where yet another set of intervention design skills and methodological manoeuvres comes into play in the analysis.

An iterative analytical methodology

DF: From the way you describe this process, one might think that the process could take weeks, even months to complete. Yet, when I was your client, it never took more than one—or, at most, two—three-to-four hour sessions of my time to produce any of the hundreds of minimalist interventions we worked together on. How do you get it all done so quickly?

JW: It wasn't always so fast. Years ago, when we were first developing the methodology, it used to take months of analysis in some cases; but now, as you said, it frequently takes no more than a matter of three or four hours of the client's time, and we very often complete the entire process, both the first and second phase, in a single, analytical consultation. Moreover, it's typically only one person we ever need to meet with.

Now, as I think I said earlier, the steps to define a desired outcome are iterative, as are the second set of steps to design that outcome down to the last detail. In fact, the two sets of procedures overlap and the intervention-design steps get meshed back into further iterations of outcome-definition, because that definition gets continually refined and perhaps even radically redefined as the analysis proceeds. Nonetheless, within a remarkably short time the client's preferred problem-definition has shifted almost unrecognizably away from the originally proffered problem definition, where it started.

Which is yet a further reason why, for us, in common with numerous contemporary systems approaches, the particular presenting issues are totally irrelevant, topic-wise, and are just as irrelevant as the identity of the particular business or industry. We *almost* don't care. In our work, every situation is treated as utterly unique, and the keys to an optimal solution invariably turn out to be entirely idiosyncratic. I've never designed the same intervention, the same solution, twice. Even if the problems as presented sound superficially identical, the solutions never will be. Nor are effective solutions ever topically relevant to the problems they solve, for reasons that should be obvious by now.

DF: But that still doesn't explain how you can do so much in what seems to be so little time.

JW: Remember: our work is about filtering complexity, not modelling it! You can divide the universe in two, at worst, with each question—is it in this half of the universe of possibilities (e.g. “bigger than a breadbox”) or the other half (“smaller than a breadbox”)—and it's a poorly selected question that only enabled you to rule out half the possibilities.

So just do the math: If Problem A is 100,000 times more complex than Problem B, what's that? Maybe 2^{16} or 2^{17} ? So it should at most take only another 17 questions to filter the complexity of Problem A, compared to problem B, and at, say, 3 minutes average per question and answer, that's only what, an extra hour? Less! With decent questions, maybe only 15 minutes longer.

DF: That seems hard to believe, considering that your clients tend to be C-level executives. They didn't get where they are because they didn't have much to say. Or maybe I'm just projecting my own behavior onto all of your clients.

JW: Bear in mind, all we are doing with our questions is filtering. The client is not instructing us about her business. So, we can move really fast because we squander no time learning about the client's business or organization or issue at the client's expense. Since the client knows all that already, our learning about it will not add to the total amount of knowledge in the room!

Besides, we already expertly know our way around all the detailed matters with which the intervention-design will be concerned: the rich communicational fabric of patterned contexts and context-markers, flows of information and imparities, constraints, behavioral patterns, and so on, which the Interchange think-tank has been devoted to researching for many years, building on hundreds of thousands of man-years of work by other researchers in the scientific disciplines on which we've drawn in constructing our theory and methodologies.

DF: How then, would you characterize the nature of your practical work with clients?

JW: The Interchange methodologies themselves serve as a bridge between our alternative take on reality, along with a large body of scientific theory, on the one hand, and on the other hand, whatever specific concrete situation the client brings for resolution on any given day. The methodology is thus not a “technique,” or management process or problem-solving protocol at all, or anything like it. Nothing so simple and lineal as all that. It's a framework for tapping into our scientific knowledge to filter the complexity of the client's situation by asking questions and responding to the answers with further questions—resembling a kind of scientific detective work.

The methodology merely guides us in knowing what we're looking for at each juncture, and, above all, knowing what questions to ask to elicit the next in the emerging series of clues. And we only use a fraction of it on any given case. Like a psychoanalyst who has spent decades absorbing a huge body of technical

theoretical material, not all of it applies to any given case let alone any given analytic session, and she only evinces her vast knowledge by sitting quietly behind the couch and saying “a-huh” and “tell me more about that.” Or a corporate lawyer for that matter. Same applies.

DF: What is all of this supposed to feel like from the point-of-view of one of your clients?

JW: However technical the analytical process may be from the professional’s point of view (for it is the same, after all, with the psychoanalyst’s or attorney’s work), from the client’s point of view it is simply a matter of responding candidly to the questions asked. Like an interview!

DF: It certainly never felt like a job interview to me. More like an interview with my physician or accountant or attorney.

JW: Obviously. From the client’s point of view, it is a matter of walking in the door with an ambitious, mission-critical business challenge deemed impossible to achieve within the desired timeframe or impossible to pull off with the available resources; or else walking in the door with a daunting, intractable issue that has defied all previous attempts at resolution (and defeating armies of well-meaning and knowledgeable consultants along the way)—and then walking out, four hours or so later, with a compelling, unique, readily-implemented idiosyncratic resolution, custom-designed from scratch down to the last detail, and delivering immediate and bankable results—a precision-engineered, designed outcome, good to go.

DF: James, thank you very much. Do you have any final words to leave me with?

JW: The 18th Century philosopher and scientist Lichtenberg said that if an angel were ever to tell us how the world really worked, it would sound to us at first like, “2 + 2 = 13.” I hope I’ve been able to make these ideas a bit more accessible for you.

DF: You certainly have. Once again, thank you! ☒

Profile: P. David Franzetta

Dave Franzetta, President of Interchange Associates, Inc., is based in Orange County, California. He has been working with Interchange since 1994, co-designing scores of successful minimalist interventions addressing a wide range of business issues, and immersing himself full time not only in the practice of minimalist intervention but in the science behind the analytical technology of Interchange Research.

Holding degrees in science from Michigan State University and management from Farleigh Dickinson University, and with a professional background ranging from science and naval intelligence to accounting and finance, Franzetta joined Interchange Associates Inc. following a distinguished, wide-ranging 30-year career with Prudential Financial, spanning corporate finance, insurance and reinsurance, franchise management, risk management and investment management, with a reputation for effective leadership in business transformation, including the dramatic turnaround and leadership of what became one of Prudential's best performing operating companies.

Franzetta served as Comptroller of Prudential Investment Corporation and later as Chief Accounting Officer of Prudential Insurance, and also as Chief Financial Officer, Chief Administrative Officer, President and Vice Chairman of several of Prudential Financial's operating subsidiaries.

Profile: *James Wilk, MA(Oxon), MSc, PhD, FCybs*

Philosopher and scientist, academic and clinician, Dr James Wilk is one of the world's leading experts on change. His original theoretical and empirical research on change, conducted at the University of Oxford, Brunel University, London and under the auspices of Interchange Research, an independent, international scientific research enterprise founded by Wilk, has not only yielded powerful new concepts and methods of scientific analysis but has led to significant practical breakthroughs in numerous fields ranging from cybernetics and clinical psychology to the world of affairs, where he has developed powerful practical applications of his fundamental research at the highest levels. Commercial applications of this research are delivered worldwide through the exclusive licensee of Interchange Research, the California-based firm Interchange Associates, Inc., which works with accomplished corporate leaders to accelerate the growth of their businesses, reduce costs and achieve their most challenging objectives in highly ambitious time frames through the design of precision-engineered minimalist interventions.

Dr Wilk is on the Faculty of Philosophy, University of Oxford, where he has been teaching and researching for many years in a number of areas including the philosophical and scientific foundations of cybernetics, neuroscience and psychiatry, the philosophy of science and philosophical psychology, as well as, above all, the philosophical and scientific foundations of change in nature and in human affairs. One of the most original and accomplished cyberneticians of his generation, Wilk is a Fellow of the Cybernetics Society (UK), elected in recognition of his work in applying cybernetic understanding and analysis to the study of psychological and behavioral change in clinical practice, organizational behavior and society, and

he has been a frequent presenter at scientific meetings and conferences on cybernetics and related areas of scientific research.

Originally trained at the University of Oxford as both a neuroscientist and philosopher and then in social science and social policy at postgraduate level, he went on to complete further postgraduate work in cybernetics, philosophy and psychology, as well as qualifying and practicing clinically as a psychotherapist, and he is also an accomplished clinician and researcher in the psychiatric field. Throughout his career, Wilk's pioneering research—spanning cybernetics, semiotics, complexity theory, philosophy, neuroscience, psychology and theoretical biology—has been dedicated to investigating the nature and dynamics of change in nature and human behaviour.

Wilk has recently been Erikson Institute Visiting Scholar at the Austen Riggs Center, Stockbridge, Massachusetts and a Visiting Fellow in Psychiatry, Department of Psychiatry, Weill Cornell Medical College. He is also based at The New York Academy of Medicine, where he is a Fellow and Senior Advisor to the President, addressing a wide range of strategic and policy issues spanning all aspects of the Academy's work on urban health and related areas globally, and where he conducts applied research in minimalist intervention and lectures on the science behind it.

He has written extensively about his work, and is currently preparing a number of monographs for publication in due course. He is also working to complete his long-term project to set out an in-depth, theoretical synthesis of his philosophical and scientific work on change, his *Principia Metamorphologica*.
