The Shape of Change

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This conversation took place between Melanie Crean and Sean Gourley via email during the month of September 2009. Their discussion focused on notions of change as a physical, political and cultural phenomenon whose nature and impact, though sometimes measurable and predicable, still cannot be strictly defined. Crean is an artist and teacher, living in Brooklyn and teaching at Parsons The New School for Design. Gourley is a mathematician, political advisor, and current TED fellow who lives in San Francisco. The interview was published in the second issue of Where We Are Now online journal, edited by Joseph Grima, Marisah Jahn and Vera List Center Director Carin Kuoni, as part of the issue's guiding theme: Speculating on Change.

Melanie Crean: I am currently working a project called *The Shape of Change* <shapeofchange.com>, an online database of American and Iraqi perceptions of change to be used by artists and activists as the basis of art works and discussion. To begin our conversation, I would like to ask how you define change over time? How do you see it manifest in the world around you? How do you address it in your own work?

For me, the word change, as with any signifier in language, is tightly bound to its cultural context. To state the obvious: the meaning of change itself seems to be changing, in fact quite rapidly emptying itself of meaning. Recently, there has been a strange unspoken international agreement on change; it has become a self-replicating brand. In the last U.S. election, for instance, it was deliberately undefined. Used by both parties, the word appeared in information visualizations in the *New York Times* and you could see how often both parties used the term at their national conventions. But neither party defined it; it was deliberately left to loosely encompass whatever the listener considered desirable. Though deliberate ambiguity is a time-honored tradition in politics, I feel it has been noteworthy recently because the more powerful the "brand"of change becomes the more meaningless it seems to become.

The Shape of Change project brings up several questions: why and how does the nature of change change? Is it a predictable pendulum (change-stasis-change-stasis), or are there more complicating factors at work? How can it be quantified? Can it be predicted? And, if so, can change be seen to be at all fixed?

Sean Gourley: For me change is defined by "something being different." In general, as time moves forward, something is always different. But then time is defined by difference. Time and change are inextricably linked. Change cannot happen without time moving, and time cannot happen without change. The very way we measure time is defined by the changing position (vibration) of Caesium atoms within our atomic clocks.

So your question, how do you define change over time almost answers itself. And yet even with all this change some things remain constant. The laws of physics remain the same, unchanged in the short term. The rules that govern the vibration of the Caesium atom, or the rotation of the earth around the sun, remain constant while the objects they act on change. In many ways too, change is dependent on the observer. Dependent on what is being measured. Hold a ball above your head and then drop it. The ball has changed position, but it is still the same ball. If you ignore its position relative to the earth it has not changed. But if position is important to you, then change has occurred.

From a personal perspective, I see change around me everywhere I look. From the people moving on the street, to the traffic lights flashing from red to green. And yet there is something constant. When viewed from a distance, people seem to move in a predictable fashion, every day exhibiting the same general behavior. The light changing from red to green every ninety seconds. Many of the rules that bring about change themselves remain constant. The interesting question then becomes, is something that is changing in a predictable way still changing?

I look at change in my work from the perspective of measurement. Measurement reveals change. We cannot know if change has occurred if we cannot measure it. This has been one of the difficult elements in the study of conflict, as conflict by its very nature is difficult to measure. Yet we can measure some variables, including the way people are dying, the type of attacks that are occurring, the size of the

attacks and how all of these variables change through time. We even measure popular words that are used to describe wars like Iraq and see how these change with time – from WMDs to Shock & Awe, to quagmire and civil war. Yet, for Iraq, throughout all of the war, the laws that underlie the conflict seem to remain constant. The laws that govern how people die are predictable and defined by mathematical equations that we see repeated in war zones around the world. One person dies and for them and their family this is a massive change. The world for their relatives changes beyond belief. Yet as we step away from the case of the individual, we see that their death is part of a broader pattern that is repeated in wars around the world. A pattern that has not changed because of their death.

Economic indicators can be a driver of conflict. The unemployment rate amongst fighting age males is a significant predictor of future violence in a region. Increase this variable and probabilistically speaking you move a step closer to war. The link between financial markets and conflict is perhaps even stronger. An oil pipeline is blown up and the price of oil futures increases. The first plane is flown into the World Trade Center and within minutes large amounts of cash are moved to the Swiss franc.

Iraq is different now than it was in 2003 when the invasion occurred – it has changed. But is it better or worse, is America better or worse? Was the invasion good for some people? – yes. Was it bad for others? – yes. In many ways, this speaks to the ambiguity of change, of how our understanding of change depends on who you are and what you are measuring. It is difficult to say for any type of change, that the world is better or worse. When we drop a ball from above our heads, the world has changed but is it better or worse?

Crean: Depending on the perspective of the observer, change is also valued differently. As a follow up to a question in your last email, I'd like to ask you now: How does change constitute a central challenge for the economy? How might American corporations have been better prepared for change? How might they incorporate some of those strategies now, in the midst of current economic restructuring? And to follow something that you wrote, how might our current economic situation both drive or respond to political conflict?

Gourley: With regard to American corporations being better prepared for change, it requires one of two things. Either a better ability to see where the world is heading (i.e. what is change going to look like), or being more flexible in their organizational culture so that they can respond to change.

We can learn a lot from insurgencies about how to create organizations that can navigate changing environments. Insurgent forces have to operate in constantly changing landscapes, both militarily and politically. They do this by creating hundreds of groups that continually mutate their strategies until a successful one is found. The unsuccessful strategies are then replaced as the groups fail to survive and the successful groups grow stronger. This process allows an exploration of a constantly changing space, it allows the insurgency to quickly find new ways to operate in the changed environment. Being allowed to fail is an important part of dealing with change. Implementing some of the organizational characteristics of an insurgency might help large corporations successfully navigate this changing landscape.

Crean: We have been speaking about the psychological underpinnings of change as related to the structure of financial organizations. For people to adopt change, it seems they must both accept its potential benefits (or at least its inevitability), in addition to being able to envision living, working, or operating differently. The ability to envision change is a necessity that cannot be understated.

One exercise that beginning designers often do to test the usability of a proposed design is to construct something called a "value fiction," to imagine an environmental situation very different from their own, possibly with different social and technological norms, to consider how their design might perform in this "extreme" situation. It's surprising how difficult this exercise is, simply because people have been compelled to behave the way current social customs, prevalent technology and interactive interfaces have structured their thoughts and actions. In short, it is very difficult to conceive of true change. When asked, many students begin with proposing that the new design be smaller, faster, and easier to use for its current function, sort of the "predictable change" that you referred to. Considering an entirely new way of using a particular device, or working, or thinking, often takes a bit of unlearning.

So I would like to ask: What kind of creative approach or thought process is required by all architects of the future, whether involved in the fields of design, science, education, politics or economics? What kind of methodologies are helpful to promote unfettered thinking?

Gourley: For the "architects of the future," I think they first have to develop a good ability to look backwards. But to look backwards over a long enough timescale so that they can get a good sampling of "unexpected" events! For something that is unexpected may well have just faded from memory.

Another methodology is the random mutation of ideas within a fitness landscape. This is done constantly as part of nature's evolutionary process, and we can do a good job of simulating it in computers to solve new types of problems. In applying it to the technique of unfettered thinking, one should take an idea that you already hold and understand the core concepts that go into this idea. Then randomly change one of the inputs and see how the idea changes. So instead of trying to guess the future, you simply accept a random input and then see what happens to your theories and ideas.

Of course some things are more likely than others. So a third concept that is very important is to understand probability (what is the likelihood of something happening) and risk (what are the consequences). Probability can be determined both empirically (I have seen the ball fall to the ground 1,000 times therefore I believe there is a good chance it will happen this time) and theoretically (I know that gravity acts on all objects and as such the ball will fall to the ground). Probability also allows us to imagine different futures simultaneously. Schroedinger's Cat is a well known example in quantum mechanics. For as the world exists today there is a future where the cat is alive, and a future where the cat is dead. But for now the cat is both dead and alive and I can only know the probability that one of these worlds will exist in the future.

Crean: Your last email about system-based thinking reminded me of a recent talk by Tim Brown (CEO of IDEO), on occasion of his new book about designing for change. He spoke about the commonality of convergent thinking, taking a set of available choices, implementing the best choice and optimizing the results. The problem with this method is of course that if everyone else is working with the same set of choices, they will come up with similar answers, and progress will remain static. To create innovation, you would need to change the entire set of options, or basically redefine the system. In the commercial world, if a company is making money by doing the same thing, what would their financial incentive be for investing in redefinition?

Gourley: In short, there is no incentive to change what you are doing if you are making money: You are wildly profitable and all the senior decision makers have nice bonuses coming in. Taking risks becomes less attractive as you have more to lose. Management has to sign off on everything in order for it to be approved and you start attracting a different group of people to come and work for you – employees who want a safe paycheck and a stable environment. The classic examples of these dynamics are found in Silicon Valley, where the more established tech companies have steady income streams. But they also have large R&D divisions to try and stay ahead of all the new startups trying to take their business as the technology evolves.

Crean: You mentioned insurgent power structures being based on evolutionary models, mutating until they succeed, or being allowed to fail. In our political system, maintaining power means avoiding failure at all cost. If both our political and our financial systems are not designed to facilitate change, where does this leave us? Organizations will eventually fail if they refuse to adapt. But what of predicting the fall of powerful nations?

Gourley: There will always be change. What is somewhat under our control is how frequently this change happens. But that control of frequency comes at the expense of having any control over the size of the change when it does happen. Think of it like an earthquake: There is constant pressure buildup between the earth's tectonic plates – they push together and store energy. This energy can be released in lots of very frequent short bursts, or it can be stable for decades with nothing happening until one day it all falls apart.

With companies, the smaller the company is the more likely it is to fail, this is not due to an inability to change but instead it is because of an inability to control their environment. The larger the company you are the more power you have to control your environment, the less likely you are to fail. And

because you are large you can put off having to confront change for a long time (it took record labels the best part of a decade before they were willing to accept digital music as a revenue stream at which point they were beaten out of the game by a computer company called Apple).

Should a government or nation then, instead of trying to control everything and stop the small changes, actually encourage change to occur? Would this provide more stability at the expense of total control? The analogy of forest fire policies comes to mind. It was deemed that forest fires were inherently bad and they should be stopped at all costs. A lot of money was put into this project and for the most part it worked very well. But when a fire did happen, it was massively destructive as all the old dead timber that would previously have burned in the smaller fires is stockpiled as fuel waiting to burn.

But then if you had power (or money) would you, too, try everything to protect it? It's a difficult concept to grasp, the need to let some fires burn in order to save the forest in the long run. Can we predict the fall of powerful nations? Given enough data I think we could get fairly close. We already know some of the main predictors of conflict.

Crean: If you could somehow give change some visual form, what would it look like?

Gourley: For me, the way that I visualize change is to go to the beach and watch the waves moving towards the shore breaking as they come to land. For me, waves represent many of the elements of change. No two waves are ever the same, yet every wave is in a sense the same wave. The place where they will break is determined by the sand or coral underneath the water, yet the waves act together to change this over time. They are also a product of a larger system of tides and the movement of the moon. And their very shape is dictated by a combination of gravity and electrical charge of hydrogen atoms. You also get to see the tipping point of change – before the wave breaks, the water is calm and the wave reveals itself as a simple vertical displacement of water. But just a few short seconds after this, the water turns white and violent as the wave crashes over the sandbar. This change is predictable, which is why we can surf – but it is always changing and never the same. And change, like the wave, is nothing more than the simple transference of energy from one particle to another.

Where We Are Now was founded in November 2007 by an ad hoc group of representatives of many arts organizations in the city, among them The Change You Want to See Gallery, Creative Time, Cooper Union, Parsons the New School of Design and the Vera List Center for Art and Politics. It is a discursive and loosely organized platform with the mission to illuminate, deepen and amplify the discourse around an aesthetic practice with political content in New York City.

Other journal contributors include **Tom Angotti**, **Daniel Bozhkov, Celine Condorelli**, **Bryan Finoki**, **Beatrice Gibson, Sean Gourley, Carlos Motta**, **Andrew Ross**, **Ben Shepard**, **Mark Tribe** and **Merve Unsal.**

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