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DAVE GILMORE

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BECKY SEBOLDT

Production Director/Senior Editor

MARY PEREBOOM

Principal, Research and Administration

BOB FISHER

Principal and Editor-at-Large

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From the Management and Editors

We just completed the Leadership Summit on the Future of Environmental Responsibility in Minneapolis this month. What a phenomenal event it was! This deep-green edition of the DesignIntelligence Quarterly features many of the speakers from the event.

Jonathan Salk is co-author with his father, the late Jonas Salk, of “A New Reality: Human Evolution for a Sustainable Future”. Recently, Jonathan and David Dewane have updated the book to examine how all of us can have a role in ushering in the next epoch. The two men spoke with DesignIntelligence about their adaptation and the continued relevance of population issues in today’s world.

Terreform ONE was founded more than a decade ago to find solutions to cities’ environmental challenges by merging education, design, research, public outreach and science, with a concentration on socio-ecological design. Mitchell Joachim and Vivian Kuan spoke with DesignIntelligence about their organization’s focus and how we can all make a difference in designing a future that protects our planet’s living species.

Dr. Adrian Parr is a philosopher and cultural critic who works at the intersection of environmental, social and political activism. She is a UNESCO Chair of Water and Human Settlements and Dean of the College of Architecture, Planning, and Public Affairs at the University of Texas at Arlington. We spoke with Adrian about climate change, problems of representation, cooperative design and the impact the A/E/C industry might have on sustainability.

These are just a few highlights — read on to find much, much more! As we face many drastic environmental challenges, we hope this edition will serve as a catalyst to find the knowledge and understanding we need to connect surrounding these issues — unite together — and act.

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ESSAYS

The Way of Authentic Leadership – Part 3

Real leadership, the stuff that moves people, events, nations and the world, is found through the power of influence. Influence is perhaps more powerful than any other force in the continuum of transformation.

DAVE GILMORE

Leaders without influence are perhaps not in the right role. These often act as shopkeepers minding the store, engaging with customers to answer inquiries, stocking the shelves, opening and shutting the store as scheduled, and ensuring a predictable workflow day to day.

By contrast, leaders operating from a core of influence often surprise us and are consistently comfortable with the unpredictable. They possess mastery in communication and challenge the status quo. These challenges are meant to make space for and elicit new thinking, speaking and behavior from the organization that ensures relevance and effectiveness.

A CEO of a large architecture firm I know often states, “I’m completely comfortable with ambiguity as long as there’s clarity.” Sound oxymoronic? Not really. What he is saying is that a part of leadership always involves ambiguity, which translates as not always having answers, but as long as we understand this, there’s a new clarity to be embraced. Leaders of influence always allow for the positive possibilities of ambiguity.

When leaders attempt to know it all, control it all and manage it all, they enter a circuitous trek towards functional dilution. They circle ‘round and ‘round in ever-tightening cycles of vigilance to ensure everything is as they dictated it should be. There is no end to the number of spinning plates propped precariously atop the myriad sticks requiring attention, energy and attempted balance. This sincere attention to the work of leadership is sadly misguided, resulting in failure on multiple dimensions.

You see, it is not the strength of the grip that yields the most effective outcomes, it is the freedom of the open palm that allows for more. A closed posture cannot receive, while an open one is poised for whatever comes along. Attempting to control everything limits far more opportunity than can be calculated.

In the openness of receiving there is a certain discernment necessary to exercise to ensure what is being received is what is good and right and true for the organization. Without such discernment, chaos ensues, sending the organization into an unhealthy swirl of disconnects.

Bill became the managing partner of a significant A/E/C firm less than 10 years ago. He was the chosen internal candidate for the role in competition with two outside candidates. When he was selected above the others, I was asked by the board of directors of this firm to spend time with Bill to assist him in his transition into senior-most leadership.

Over a dinner with some of the board directors and Bill, I asked what the primary factors in Bill’s selection were, the question meaning to yield some affirmational statements on Bill’s behalf. One of the directors responded, “Bill is a

“

Leaders of influence always allow for the positive possibilities of ambiguity.

known quantity. He sticks to the knitting and gets the job done. With Bill we're assured the trains will always run on time!" Another piped in, "That's right! Bill is dependable and has been around long enough to really know the organization's culture. That's comforting to us all."

There was a general agreement around the table and yet a cloud passed over Bill's brow for a moment. I wondered if he was wondering about the same thing I was wondering about. An hour later the dinner ended, and folks went on their way. I asked Bill if he would stick around a bit longer and he readily agreed. It was a fine night for a stroll, so we crossed the street and took a broad and well lighted path through the park.

I began, "So they had some nice things to say about you. Seems all have high confidence in you as the leader who will get things done for the good of all."

He responded, "Yep! That's what bothers me. What happens when I can't? I mean, what will they think of me if I don't? I'm worried that this may be more than I can handle."

"What do you think this role really is? And with that, what would you say are the primary attributes you should have and exercise to be successful?" I asked.

"Well if success is defined as keeping the trains on time, there's not a lot of room for new things, are there? I mean, what about changing things? It appears that what they chose me for was to maintain, not change anything," he responded.

"Didn't any of this come up in the interview series? Did you offer new ideas and promote what your vision would be for the firm if selected to lead it?" I prodded.

"Yes, it did, but from their comments this evening it seems they are more interested in maintaining than transforming," he responded.

The conversation lasted another hour as we circled the park a few times and we agreed to keep talking over the coming weeks.

But as things would have it, Bill never emerged from the cloud of expectations the board had burdened him with. He felt he now had to prove himself before he could introduce change and exercise broader influence towards transformation. Months passed into years, and the firm maintained its 2-3% year-over-year growth. Competitors sped past them, innovation and invention fell on deaf ears, and talent came and went. Bill had no defining or driving vision to propel the organization to new heights.



Attempting to control everything limits far more opportunity than can be calculated.

Mind you, the firm is doing okay. Nothing bad about that, it is just that it had the opportunity to be so much more.

Achieving vision also requires taking risks. Perhaps the toughest risk most leaders encounter is the risk to reputation. Most shrink from risk if it might garner criticism or reputational doubts. That is to say, many are more fearful of others' possible negative opinions than doing what is best for the greater good. But when an authentic leader is willing to put ego on the line to see transformative vision occur, that is when possibilities move towards probabilities.

Here is an important point to make about influence: vision fuels influence. Critical to the effective use of influence is a guiding or driving vision intent on changing what needs to be changed and empowering what needs to remain. Additionally, effective influence possesses the power to mitigate most organizational risks. Authentic leaders will operate from vision, exercise influence to broaden buy-in and purpose, and be willing to take appropriate risks to achieve what is best for their organization.

Vision, influence, risk-taking ... all functional attributes of an authentic leader.

Dave Gilmore is the president & CEO of DesignIntelligence.

Our New Reality: Updating Jonas Salk's Predictions for a New Epoch

Nearly 40 years ago, Jonas Salk and his son Jonathan wrote a book about the transition from centuries of population growth to population equilibrium and the impact that such a change would have on society, global interdependence, and the environment and its resources. Recently, Jonathan and David Dewane have updated the book, called "A New Reality," to examine how all of us can have a role in ushering in the next epoch. The two men spoke with DesignIntelligence about their adaptation and the continued relevance of population issues in today's world.

DESIGNINTELLIGENCE WITH JONATHAN SALK & DAVID DEWANE

DesignIntelligence (DI): What inspired the two of you to work on a new edition of "A New Reality"?

Jonathan Salk (JS): My father had the basic idea back in the early '70s. Later, he was invited to put together a book for the United Nations using their population data. He got behind on it, asked me to help him, and I did. It came out in 1981. It didn't receive much attention at the time, but my father continued to lecture about the idea until his death in 1995. As time went on, I saw that trends toward sustainability, interdependence, cooperation were coming to pass. I was thinking about reissuing it and then out of the blue, I had a call from David.

David Dewane (DD): In "No More Secondhand God: And Other Writings" by Buckminster Fuller, there's a passage dedicated to Jonas Salk as a champion of anticipatory design, which is a major interest of mine. Then I was at a Design Futures Council meeting, and Jim Cramer mentioned this book specifically by Jonas Salk. So, I read it, and it crystallized so much of what I had been feeling internally in regard to the

cultural, conscious shift toward sustainability; it also put it in a scientific framework that I felt was really validating.

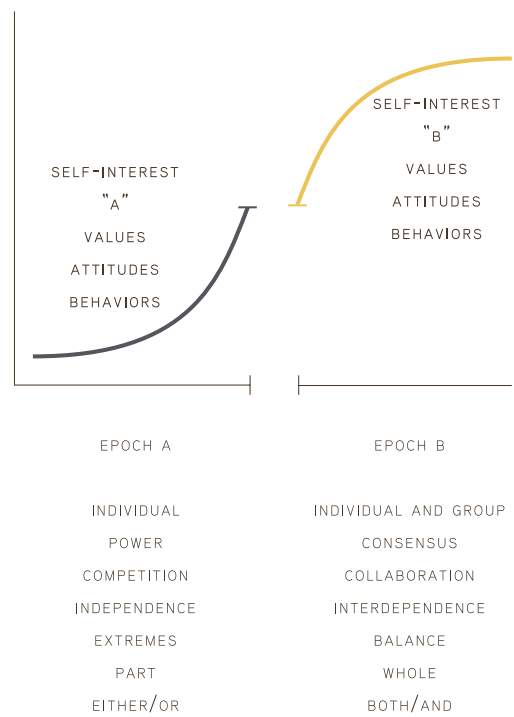
DI: How did the content need to be adapted for today's audience?

JS: There are changes in text and language and in the overall design. My father's writing style was elegant but sometimes a little bit complex and turgid. So there is an attempt on my part to make this more accessible to a general reader without oversimplifying it or dumbing it down. The biggest thing however, and I owe this entirely to David, is the visual presentation and design of the book. We worked with a wonderful designer name Courtney Garvin who added a human element: color, redesigned graphics and beautiful photographs.

DD: The higher purpose for designing it this way is the audience has changed. Now the readers of this book will live out one of the most exciting chapters in human history. It's the lifespan that is going to straddle that inflection point, and I don't think that was necessarily the audience the first one was written or designed for. We redesigned it in a way

that could be read by high school kids or college freshmen. They are the people whose lives are going to be most deeply impacted by this text.

DI: Can you explain the concept of the two major epochs that you describe?



JS: It's a very visual concept based on an S-shaped growth curve. The basic idea is that, after centuries of accelerating population growth, we are entering a different era. As we do, we need to adapt to different conditions, particularly conditions of limitation and slowing of growth in population. In doing so, there is a necessary and desired shift in values, attitudes and behaviors. It has become clear in the past 30 to 40 years that resources and the ability to dispose of waste that once seemed totally unlimited, are not. We are hitting those limits and need to make adaptations. Those adaptations include going from competition to cooperation, independence to interdependence, constant growth to a state of equilibrium, and going from an "either/or" philosophy to a "both/and" philosophy. Those are the major shifts that happen right around the point of inflection in the population growth curve.

DI: What propels the change between these epochs?

JS: It is a matter of what we as individuals, groups and a species need to do to survive. What conferred advantage when things were accelerating and growing without limit is no longer advantageous. In order to adapt and survive, we necessarily have to make this shift in values.

DD: If you're a hotel company that shares resources, that suddenly confers far more advantages on that company than a hotel chain that tries to dominate by just acquiring as much real estate as possible. That model of thinking is very Epoch A. Airbnb is a great example of Epoch B thinking. I think the biggest challenge, frankly, is for a lot of companies that were established and enjoyed success in Epoch A to try to reimagine themselves in Epoch B. How do you make a polar change?

DI: What leads you to believe we are at the inflection point between these two epochs?

JS: Objectively, we are at the inflection point in terms of population growth. In addition, we are seeing the difficult process of the emergence of new adaptations in conflict with old ones. There is conflict between increased international cooperation and interdependence and polarizing nationalism. Companies and corporations engage in resource sharing. Climate change is another huge factor; it is clear we are approaching limits to our planet that are going to require behavioral and attitude changes.

DI: When we think about ourselves as a world community, what is our responsibility in bringing about this new epoch?

DD: The population rate is now going down for the first time in human history; there are fewer people that will be born in 2020 than there were in 2019. For 100,000 years, that was not really true in any long-term trending formula. The real number of where population ends is unknown, but the median is around 12 billion. Once it locks in at that number, it is going to be with us for a long time — hundreds of years. A population will basically go into dynamic equilibrium and stabilize at a point. The responsibility of this

current generation of designers or policy makers is to try to get that number to come in as low as possible. Then that's the difference between nine or 10 billion people competing for all the world's resources versus 16 billion.

JS: There is an urgency now in terms of climate change that didn't exist 10 or 15 years ago. It's our responsibility, overall, to take care of the earth and the best way to do that is to take care of the welfare of each living being on that earth. For example, factors that help slow population growth in the developing world, where population increase is the most rapid, are improved socioeconomic conditions, better health-care, decrease in infant mortality, and increasing the education of women and their ability to make reproductive decisions themselves. Those factors cause people to have fewer children per family. This is a real win-win solution because it helps the people in those areas live a better life, and overall, it helps in terms of the number of human beings on the earth, which benefits us in the developed world as well.

DI: What role do architects and designers play in this new epoch?

JS: Architects and designers are in a position to look toward the future and figure out entirely new ways of adapting and living our lives in spaces and as communities. Architecture is a huge part of this because architecture, at its heart, is not just about form and structure, but about humans and human interactions.

DD: The challenge for architects is to get over the fact that 21st century-architecture in Epoch B is not simply about the skillful manipulation of form and combining building materials together. Architecture is about giving a body and organization to anything that requires a diagram. It does not have to be physical. Also, 90% of the work that is open to us isn't necessarily built environment. Don't wait for a client to come knocking on your door with a project. Be entrepreneurial. Be anticipatory.

DI: What can each of us as individuals do to help with a successful transition into this next epoch?

DD: Zoom your scale back out. Take the individual and then take their entire body of work. You can start to use a very small amount of well-placed energy to move large systems. In that way of thinking, individuals can become extremely powerful. You should not be intimidated by just being one person or one firm.

JS: We need to design new kinds of political, social and economic systems that are based on adapting to the different conditions of Epoch B. In doing so, that involves change in individual lives, at the family and community level, all the way up to the planetary and global. We each can have a role to play in every one of those levels.



Architecture, at its heart, is not just about form and structure, but about humans and human interactions.

Jonathan Salk is co-author with his father, the late Jonas Salk, of "A New Reality: Human Evolution for a Sustainable Future". A graduate of Stanford University and the USC School of Medicine, he completed specialty training in psychiatry at UCLA David Geffen School of Medicine where he is currently Assistant Clinical Professor. He is in practice in Los Angeles and is a Senior Fellow of the Design Futures Council as well as a member of the advisory board of the Population Media Center.

David Dewane is a journalist, architect, entrepreneur and educator. His background is in ecologically and socially equitable design. David is a Halycon Fellow, has been honored as an Emerging Leader by the Design Futures Council, and was certified as an EVOKE Agent by the World Bank Institute.



Designing Against Extinction with Terreform ONE

Terreform ONE was founded more than a decade ago to find solutions to cities' environmental challenges by merging education, design, research, public outreach and science, with a concentration on socio-ecological design. Mitchell Joachim and Vivian Kuan spoke with DesignIntelligence about their organization's focus and how we can all make a difference in designing a future that protects our planet's living species.

DESIGNINTELLIGENCE WITH MITCHELL JOACHIM & VIVIAN KUAN

DesignIntelligence (DI): How did Terreform ONE recently come to focus on species extinction?

Mitchell Joachim (MJ): Terreform always focused on climate and environmental issues; it was number one for us. We came to realize our primary goal was to save ourselves from wiping our entire society — globally — off this planet forever. We're doing that by killing everything around us. Every seven minutes, we seem to wipe another species off the face of the earth. Statistics say roughly 50-60% of all life on this planet just disappeared. Architects, urban designers, planners, developers and anyone in and around this field are all somehow complicit in this. Our credo became "design against extinction" to express our desire to stop this kind of insanity. We're now in the process of orientation realignment.

Vivian Kuan (VK): The complex interdependence of our ecosystem often gets overshadowed by a focus on the technical side of the climate crisis and global warming. Part of our nonprofit vision is to raise awareness and increase public outreach by engaging the public in discourse about our ecosystem and its connection to human and living species. We continually refine our mission in light of the changing conditions of our built and natural environment. The term "sustainability" doesn't capture the urgency of what is needed at this point. So, we've reset "species extinction" as the ultimate consequence

of the trajectory that we are on. It is a new bar, a higher bar that encompasses all living species that are endangered as a result of the climate crisis and our human actions.

MJ: There's no way any one group is going to solve this problem; we're on the tip of the spear, but we need a lot of other soldiers, generals and thought leaders to be critical of the things we're doing and that others are doing. Everyone should be involved in this dialogue to get ourselves out of this problem we created.

DI: As a society, how should we define our responsibility in our relationship to the environment and other species? What does the right relationship look like?

MJ: I don't think we — and "we" meaning as many people as possible — really like changing our behaviors. We like keeping business as usual. I'm not an advocate for changing our base behavior because it's not going to work. I think it comes



Every seven minutes, we seem to wipe another species off the face of the earth.

down to the design and engineering fields to re-think the products we produce, the artifacts we make and the buildings we design. We need an understanding of the earth's metabolism and the life cycle of the opportunities we create. We need to make sure these things return appropriately to the earth and do it in a way that makes some financial sense. It's hard to do, but it's definitely possible. It's certainly possible to show the math in the long term, and even the mid-term gains. The big fight will be surrounding the design of energy systems — the big carbon question is the killer at the moment. We need new narratives about living in a civilization with green and renewable energy systems that make sense with our economies, both global and local.

DI: What are examples of successful approaches to the type of environmental challenges you work on?

VK: Our “socio-ecological” approach uses a research-based design process to bridge the gap between a society that is dominated by data/technology, and the need for living things to connect to nature. One example is our recent monarch sanctuary project in the Cooper Hewitt, Smithsonian Design Museum Triennial Exhibit; it's a double-skinned façade that is a biome way-station for monarch butterflies. Monarch butterflies are facing the risk of extinction in large part due to habitat loss and in particular, the loss of their main food source, milkweed.

However, the project is really a call to action for architects, designers, developers and owners to find novel and innovative ways to integrate nature into cities, architecture, buildings and communities because we need to address biodiversity loss, which will ultimately affect the quality of urban living.

Teamwork is and will become more and more critical to resolving the growing complexity of our environmental issues. For this project, we worked with BASF's material scientists to help create super-sustainable concrete panels with a smaller carbon footprint; it's a concrete product that's not even on the market. BASF scientists were able to replace cement content with recovered waste materials like fly ash and improve flow-ability using innovative admixtures so the material was moldable and easy for designers to adapt to their imaginations. The

project also gave us an opportunity to experiment with different recyclable materials and not rely on the traditional material methods and means. There's a lot more ways to increase the range of sustainable biomaterials we can use in the construction industry that are healthier for the environment.

DI: What role can architects, designers, engineers, contractors and others who create the built environment play in preserving species and a healthy ecosystem?

VK: Since we are arguably at or beyond the tipping point of the climate crisis, we have an enormous challenge and opportunity in front of us as stewards of our built environment. Within the construction practice, green building certifications have exploded and yet biodiversity represents less than 5% of the targeted criteria. How can we convince clients and owners and even partners in our own firms to include research on biodiversity in every built project? It is a challenge but I'm optimistic that we have the skills and creative vision to accomplish this as long as the mindset exists.

The power of creative collaboration, working with various stakeholders outside of the A/E/C community and across sectors, will be a key element in bringing about the speed and scale of change necessary to preserve a healthy ecosystem. We hosted a design workshop for the Environmental Defense Fund to create pilot programs for air-quality monitoring across New York City, Houston and Los Angeles. Having corporations and city agencies at the same table to figure out how to align disparate incentives and use technology in innovative ways to improve air quality, was inspiring and productive.

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Teamwork is and will become more and more critical to resolving the growing complexity of our environmental issues.

MJ: We're using imagination and design to help people realign their thinking and look at their base business models to push forward in a way that's plausible. The workshops we do communicate that. Beyond the Environmental Defense Fund, we've done projects with BASF that involve entire communities of people: firemen, community activists, farmers, mid-level government officials, people concerned with job creation and other people who never participate in these kinds of things. Then we also bring in experts in planning and geography, landscape architecture and more. They are all speaking together about making a better place. Design is an incredible process that I still have faith in.

DI: Considering the enormity of the problems we face, and the scale of response needed to address them, what can each of us as individuals do to make a positive difference?

MJ: I think for anyone in this field, that's our job. Architects and designers probably have the most understanding, awareness and neutral referendum to build up relationships between all the different parties and referee ourselves through these problems, so we have to be advocates at the front. I think it's absolutely ingrained into the very structure of who we are. We've got to do more for the environment, we've got to do more for biodiversity, and we can't accept the old ways of doing things. At the same time, we really do need to listen to people who are resistant to this kind of change. I think that's the key — it's not so much about yourself promoting this, it's actually about spending more time listening to why others are not interested in getting on board with it. That's how you can craft your own belief system into a kind of power you can project. By listening to the opposition, we got through it, and we made something better. I think that's my advice to others if they want to really invoke this platform.

VK: Individual mindset can make a difference. So much of our practice is very competitive, and we really need a different mindset to band together on this one goal of making a positive contribution to the environment. In an industry traditionally dominated by a network of large, global practices, we can leverage our combined resources so much more if we collaborate on this agenda, which is really a vision for greater good. The United Nations is leading the cause, so it's not just the voice of design. We can join these other massive groups and do something to be on the right side of history for our field.

Dr. Mitchell Joachim is the Co-Founder of Terreform ONE and an Associate Professor of Practice at NYU. Formerly, he was an architect at the offices of Frank Gehry and I.M. Pei. He has been awarded a Fulbright Scholarship and fellowships with TED, Moshe Safdie, and Martin Society for Sustainability, MIT. He was chosen by Wired magazine for "The Smart List" and selected by Rolling Stone for "The 100 People Who Are Changing America." Mitchell won many honors including: ARCHITECT R+D Award, AIA New York Urban Design Merit Award, 1st Place International Architecture Award, Victor Papanek Social Design Award, Zumtobel Group Award for Sustainability, History Channel Infiniti Award for City of the Future, and Time magazine's Best Invention with MIT Smart Cities Car. He's featured as "The NOW 99" in Dwell magazine and "50 Under 50 Innovators of the 21st Century" by Images Publishers. He co-authored three books, "XXL-XS: New Directions in Ecological Design," "Super Cells: Building with Biology," and "Global Design: Elsewhere Envisioned." His design work has been exhibited at MoMA and the Venice Biennale. He earned: Ph.D. at Massachusetts Institute of Technology, MAUD Harvard University, M.Arch. Columbia University.

Vivian Kuan is Executive Director at Terreform ONE. As an architect with an interdisciplinary background in art, architecture, real estate development and tech-marketing, she is dedicated to improving the future of our environment through impactful design and education.

Vivian is currently faculty at Parsons in the Strategic Design and Management graduate program. She was a Launch Director at the incubator, idealab! and later directed the online strategy and e-commerce business units for the Estee Lauder Companies, Inc. and for The L'Oreal Group Inc. Before business school, Vivian worked as a project manager in Hong Kong for Sun Hung Kai Properties, Ltd., where she managed the conversion of the Ma Wan Island to a residential town

complex and building towers in Hong Kong and China. She gained her foundation as an architect in New York City working on the Shanghai World Financial Center, Atlanta Federal Center, Taichung Tower and the IRS National Headquarters for Kohn Pedersen Fox Associates. She earned an MBA/M.A. at the Wharton School/Lauder program, University of Pennsylvania, and B.Arch. from Cornell University.



Collective Design for a Changing Climate

Dr. Adrian Parr is a philosopher and cultural critic that works at the intersection of environmental, social and political activism. She is a UNESCO Chair of Water and Human Settlements and Dean of the College of Architecture, Planning, and Public Affairs at the University of Texas at Arlington. We spoke with Adrian about climate change, problems of representation, cooperative design and the impact the A/E/C industry might have on sustainability.

DESIGNINTELLIGENCE WITH DR. ADRIAN PARR

DesignIntelligence (DI): How did you get to where you are today? Tell us about your path.

Adrian Parr (AP): For my master's degree in philosophy, I focused on how trauma impacted the ability of Holocaust survivors to represent what they had gone through. Traumatic experience dramatically exposes the limits of representation. This research set the tone for further investigation into the problem of representation. There is always an excess or an inarticulable dimension that a given representation never fully captures.

That led me to studying Leonardo da Vinci's notebooks for my doctoral thesis. Leonardo's ability to bring art, science, urban design and engineering into conversation with one another was intriguing to me. In particular, I was especially



We can't neatly extract a problem from its context. I was intrigued by nascent properties and elements that inform and formulate a given problem.

excited by the manner in which his representational process involved cross-disciplinary collaborations, which in turn resulted in open-ended and provisional ideas and images. The notebooks were filled with anatomical, perspective, mechanical, and hydrological representations that carried within them emergent forces, traces of other ideas, and ghostly remains of previous works. The more I studied his drawings and notations, the more it seemed to me that the very act of trying to represent life in all its complexity necessarily resulted in fundamentally unrepresentable domains that indicated an emergent system, which in turn carried an important creative function for Leonardo. As such, the thesis went on to become a theory of creative production.

That is when I first began to think about the ways in which we can't neatly extract a problem from its context. I was intrigued by nascent properties and elements that inform and formulate a given problem.

It was at this time that I turned my attention to the built environment, drawing on my previous work into trauma and the limits of representation to think about how communities deal with collective trauma and, more specifically, the invisible and silent dimension of representing shared trauma in built form. This prompted me to question how other kinds of events also incur a similar kind of traumatic energy that

inflicts a wound on the landscape and — more broadly speaking — our environment. It was then that I found myself thinking about the relationship between the built environment, climate change and environmental degradation as a kind of trauma infusing the landscape. Additionally, I wanted to examine how human beings might collectively address some of these challenges.

DI: Was this drive toward representation one of the reasons that your work on environmental issues has involved film?

AP: Absolutely. The film project, called “The Intimate Realities of Water,” is a result of my UNESCO appointment. I spent four years in and out of the slums in Nairobi, Kenya, assessing the cultural appropriateness of water and sanitation facilities. These are simple functional structures that might be perfectly engineered and yet some people with no other sanitation option choose not to use them — either they are too expensive, people feel the spaces are unwelcoming or foreign, or they might be situated in areas where women don’t feel safe.

We often use very large statistics to help explain why the United Nations comes up with certain policies. For example, UN-Habitat reports that 1 billion people, or one in eight, live in slum-like conditions. Two million tons of waste are deposited globally in waterways each day. Two people are added to the urban population of the world every second.

However, what statistics miss is how the numbers play out on the ground. For me, it was important to humanize that data. I quickly discovered that the surveys I was administering did not capture all the nuances of how water shapes all facets of everyday life in the slums. The idea to make a film was actually one that the women in the slums came up with together; I wanted them to be able to represent their own reality on their own terms, not on my terms or those of a standardized survey. A film allowed them to take control of how they were represented. In this sense, the research and the outcomes of it were a cooperative venture.

Data has the potential to be deeply affective, to dramatically change the conversation in policy and development circles.

The filmic medium, which combines narrative, numbers, image, motion, time and sound, stimulates another kind of conversation around and perspective on big data, one that engages with the representational leftovers of what the data cannot capture.



One billion people,
or one in eight, live in
slum-like conditions.

Two million tons of waste
are deposited globally
in waterways each day.



Two people are added to
the urban population of
the world every second.

DI: Why did you choose to focus your efforts on water as a resource among all the other aspects of sustainability?

AP: Water is the perfect thing to focus on if you’re interested in systems-thinking because it’s an environmental and social issue. It concerns problems of equity and health. It’s cultural. It’s also economic, such as the growing privatization of water resources and services. By focusing on water issues, you are able to engage with a systems approach to problem-solving.

DI: There are people out there who would consider your stance on environmental and social issues to be radical. Yet you often call for engaging with people who hold different views. How can we work across philosophical, economic, and political divides?

AP: I think it's a misrepresentation to consider me radical. That said, I would like to see my work as being activist; I am deeply committed to making a contribution in bringing about change. I'm quite adamant that we need to be working from the inside — from the reformist position, trying to change the system from within. That is not a radical position to hold. But I also advocate, like a radical might, for revolutionizing forces that push from the outside. Rather than position myself as either on the inside or outside, as a reformer or radical, institutional or grassroots change, I share with Marx and other Marxists the view that the global system of endless capital accumulation functions by appropriating the limits presented to it by placing these in the service of further accumulation. Appropriation is the biggest challenge for transformative politics. I maintain that if politics is to destabilize business as usual and send it in a different direction, it must first and foremost incorporate a mechanism that staves off appropriation; otherwise, it will not be effective. It must therefore continually and nimbly jump between working inside and outside the system.



These are problems that require all kinds of entities to come together. They require creative combinations that involve the public sector cooperating with the private sector, young with old, humans and non-humans.

You have to feel comfortable having conversations across multiple political divides. The minute you stop the conversation, everyone becomes entrenched in their ideological positions, which does not help the situation.

We also need to have inventive ways of responding to the problems surrounding environmental and climate justice. This gargantuan task requires successfully negotiating with a variety of perspectives. It will mean experimenting with new technologies, alternative forms of social organization, and new ways of building (cities are responsible for over 70% of global carbon dioxide emissions). How do we move beyond a human-centric representational framework to design more inclusive environments? How might a non-anthropocentric built environment work?

These are problems that require all kinds of entities to come together. They require creative combinations that involve the public sector cooperating with the private sector, young with old, humans and non-humans. The problem emerges when one entity becomes too dominant in that relationship and is driven purely by advancing profit margins at the expense of social accountability. That's where the public sector needs to be stronger and willing to regulate when it's required.

DI: What examples can you point to of successful approaches to the type of environmental challenges you work on?

AP: The international Global Covenant of Mayors for Climate Change and Energy is a wonderful initiative that assembles the power of localized action and engages different stakeholders (research institutions, private sector and government sector) for collective impact (for example, to reduce global carbon dioxide by 60 billion tons by 2050). More than 9,200 cities across the world have signed on to this initiative. The more urbanized the population becomes the more power city mayors will have in solving the problem of climate change. The green initiatives in Chicago are also a fantastic example. However, greening in the absence of equity, as I outline in my work, is mere window dressing.

I moved to the Dallas-Fort Worth metroplex one year ago and was delighted to discover the many cities that make up the metroplex were proactively working to create a greener, friendlier, and more inclusive urban environment. Some examples include the Lewisville 2025 plan; Trinity Works in Fort Worth negotiating the conservation of 1,600 acres; Dallas

participating in the international 100 Resilient Cities network sponsored by the Rockefeller Foundation — these are all success stories. When I came to Texas, I had a stereotypical view of what Texas is: cowboys and ranchers with a gung-ho attitude to the environment that consists of seeking short-term gain whatever the cost. I certainly did not think there would be a strong culture of environmentalism. To my surprise and delight, in the Dallas-Fort Worth area there are lots of organizations and individuals who are extremely committed to making the city more livable and prepared in the face of climate change, to trying to lower the carbon footprint of the city and look after the waterways and the Trinity River system.

DI: What role do architects, designers, engineers, contractors and others that create the built environment play in bringing about positive change?

AP: Positive change can't happen in isolation from the political sector because we also need innovative zoning and policy. In the U.S., density must replace the development model of endless sprawl. We need more efficient and extensive public transit linking neighborhoods and the downtown to other urban centers and rural towns, the incorporation of urban farming into urban green spaces, efforts to put blue and green infrastructure to work, investment in smart cities research, sufficient affordable and well-designed low-income housing, and the involvement of our youth in urban design and development.

It's also going to require a cultural shift. People are going to have to be happier with less square footage and traveling less in their cars. We can create more public spaces that encourage the intermingling of different demographics, which is central to creating more friendly and welcoming cities. We can take into consideration the flourishing of other-than-human species in our urban designs. In Washington State, WSDOT is working on creating multiple fish passages where state highways traverse rivers and streams so that fish can continue to migrate and help keep the state's waterways clean. This kind of out-of-the-box, trans-species approach to design and development is a fantastic step in the right direction. When considered together, not only do we have a solution that's a greener urban design, we also have a healthier, more inclusive built environment.

DI: When you think about the right relationship between humans and our environment, what does that right relationship look like? What does success look like for us?

AP: It's cooperative. Privatization is not a cooperative model. Putting new technologies to work simply for the sake of increasing a profit margin is not cooperative. Understanding water rights as a property right, in which you can have access to this particular stream but not that one, is not cooperative.

Cooperation operates at different scales. It has to engage a variety of spatialities and temporalities. What I mean by that is we need to be able to bring into the discussion future generations. It's no surprise young people around the world are at the forefront of climate change justice and politics. They are the future. It's their future that is being ferociously wrecked the longer the current generation of adults drags their heels on realistically tackling the mounting problems associated with a changing global climate.

We need to think trans-generationally. We also need to act trans-nationally, not from an isolationist and competitive position of our sovereign state interests.

Lastly, we must adopt a trans-species framework. That demands that as a species we become more compassionate and committed to recognizing and changing our own weaknesses.



It's no surprise young people around the world are at the forefront of climate change justice and politics. They are the future.

Adrian Parr is an internationally recognized environmental, political and cultural thinker and activist. She is the Dean of the College of Architecture, Planning, and Public Affairs at the University of Texas, Arlington in the Dallas-Fort Worth metroplex and she serves as a UNESCO water chair.



Breaking the Frame: Innovative Galveston Bay Park Offers Comprehensive Storm and Ecological Protection

The Galveston Bay Park Project is a collaborative effort formulated in the aftermath of Hurricane Ike, a Category 2 storm that hit Houston, Texas, in 2008. This near-environmental and economic calamity revealed the latent risk that 25% of the United States' petrochemical activity is extremely vulnerable to destruction. This shocking realization drove key players from different industries to explore solutions that would protect the area from future storms and, moreover, address ecological issues while enhancing community access to public open space through the creation of parks. While most of the industrial area facilities were protected against storm surges up to 14 or 15 feet, Ike's surges reached an alarming height of 12 to 13 feet, which lent increased urgency to find solutions. The multifaceted project has resulted in a comprehensive collaboration that includes the Department of Environmental Sciences, the Civil and Environmental Engineering Department at Rice University, international engineering firm Walter P Moore as well as ROGERS PARTNERS Architects and Urban Designers. Members of the project team spoke with DesignIntelligence about the implications of such a development for both Galveston Bay and the design industry.

DESIGNINTELLIGENCE WITH JIM BLACKBURN, ROB ROGERS, PHIL BEDIENT & CHARLES PENLAND

DesignIntelligence (DI): What was the rationale behind the team you put together?

Jim Blackburn, Civil and Environmental Engineering Department at Rice University (JB): Because of the nature of the work we're doing, our goal from the beginning was to engage an interdisciplinary team. I've been an environmental activist working to protect the Gulf Coast for decades, so I serve as the team's environmentalist and handle the public

outreach side of things, both governmental and private; Phil is the hydrologist modeler; Charlie is the practical engineer; and Rob is the visionary.

Rob Rogers, ROGERS PARTNERS Architects + Urban Designers (RR): The plan evolved from the idea of constructing a levee system along the ship channel itself, crossing it just outside of Texas City where one large gate could be constructed across the channel and connected back into the Texas City

levee. Walter P Moore has been part of the team from the beginning, bringing civil engineering experts to engage with the hydrologic mapping exercises. They discovered we could create 25-foot-high barrier in the bay that protects industry and population alike for that entire area. Charlie Penland, an instructor at Rice, works closely with the Rice University SSPEED Center. They approached us several years ago because they were trying to develop this strategy and envision what this could be. We got involved and started to talk about the programming opportunity and the ecological benefits of building this “string of islands” concept, going well beyond “simply” hurricane protection. We began to consider creating park land and expanding the use beyond storm protection to actually start dealing with ecological issues, environmental improvements, and regional access and equity. The strategy began to evolve from saying, “This is hurricane protection that will save our bacon every 10 or 12 years,” to performing every day in a bigger, broader way for the population. That’s how the early idea for an engineering solution has evolved into a broader concept about regional ecology and access with many different collaborators.

Phil Bedient, Department of Environmental Sciences and Engineering, Rice University (PB): Jim and I met right after Hurricane Ike, and we had ideas about going to the Houston Endowment for two different projects. One was from an engineering perspective in the arena of surge prediction because a lot of new information from that standpoint had just come out of the post-Katrina world. From an ecological standpoint, Jim was very interested in looking at unique, non-structural solutions that might abound. So, we decided to put it all together and go forward with one proposal. We submitted it just after the hurricane, and two months later, we were funded. As we made progress, we gained a better understanding of how to try to mitigate this very complex coastal environment, which is more complicated than many other regions due to the presence of Galveston Bay.

JB: We learned that the potential harm to the natural environment from the Houston industrial complex getting overrun by surge water is something that had not been fully appreciated and, frankly, is not truly indicated, even in current Army

Corps of Engineers studies. We discovered with the escalation of the storms, we were looking at a situation that would probably result in the largest environmental disaster in United States history, so, we decided that we had to do something about it.

DI: What do you consider to be the key features and benefits of this project? What impact do you hope it has on the local community and beyond?

Charlie Penland, Walter P Moore (CP): The initial version of the study was named the Centennial Gate Project, which involved putting a barrier at the mouth of the ship channel at the John Hartman Bridge. We started with the surge protection, which is especially important for the industrial complex along the Houston ship channel. As the concept has expanded, covering Western Harris County and the west side of Galveston Bay, that protection is of paramount importance. A key feature of the project evolution is the developing synergies with other needs, such as widening the ship channel and providing more and better recreational benefits to the area. Features like that set this apart from other projects.

JB: A critical piece is the overlap of navigation improvement with flood protection. I don’t think there has been another project in the United States that has successfully accomplished that overlap — or is even tapped into the dedicated Army Corps’ funding stream for this purpose. I would say it is probably the most important feature of what we’re proposing. One of the issues that has come up in our work is that current methodologies used in storm protections aren’t well-suited for the types of storms we’re going to see in the

25%

OF THE UNITED STATES’ PETROCHEMICAL
ACTIVITY IS EXTREMELY VULNERABLE
TO DESTRUCTION

future. With what our team developed, we had the ability to be much more creative and forward-thinking because we had private sector funding through the Houston Endowment, and we weren't constrained by predetermined methodologies dictating how we are supposed to approach the problem. It's difficult to overstate the importance of being "free" in a project like this. Our primary concern focused on a worst-case storm, which we believe to be about 25 feet of surge, and we had the freedom to develop solutions that can be meaningful 50 years from now. In most situations for projects that directly involve natural forces such as climate, we are designing solutions today using current methodologies that are almost obsolete upon arrival. By the time you get this project constructed — we're talking about projects that won't be here until 2030 or 2035 — with the climate change we see now, and we expect to see, it's impossible that what we're designing today is going to be able to function with the climate of the future. That's just a hard reality I don't think anyone has really come to grips with anywhere in the country.



One of the issues that has come up in our work is that current methodologies used in storm protections aren't well-suited for the types of storms we're going to see in the future.

RR: There's a big need to widen the channel, but we needed to figure out what to do with that leftover material. If we could couple the widening of the channel with the creation of the barrier and the park, these efforts could layer onto each other, making it a more beneficial and efficient concept. Once you tie in the widening of the ship channel, it turns into an economic development project because you're increasing the capacity of the port, which is needed to bring in new super cargo ships. If you follow the news on energy, the U.S. is becoming a primary exporter of energy, and the primary export port is Houston. This is a great confluence of opportunity.

DI: What is the current status of the project?

JB: Various government agencies are reviewing it to determine the extent to which it makes sense and that they feel comfortable with getting involved. The Port of Houston Authority has passed a resolution by the port commission to understand how they can help move this concept forward. We are meeting and talking with the Army Corps of Engineers and the General Land Office about how this project can complement the Coastal Spine Initiative. The Coastal Spine Initiative will be the federal project and we will likely be constructed under permit by one or more local governmental permit applicants. At this stage, the Army Corps of Engineers has concluded that what we are proposing is compatible with that project, so we're not in competition with them.

DI: What do you feel are the potential implications of the ground-up approach on practice more generally? What could professional practices accomplish if they are free from the constraints of fee-for-service client relationships?

RR: Essentially, we don't operate without a client. In this case, the client is the whole region. It's rare to be in a position where you're creating your own project, but I know other practices do that occasionally.

Every firm is different in terms of how they balance work typology and aspirations. While firms could not successfully for the long-term run a practice solely off projects that do not involve a fee-for-service client relationship, we feel it's important to create opportunities that speak to our firm's mission and passion. While this is an opportunity we sought with the rest of the team, it's also not totally "free" from constraints and reality. It is very much rooted in a real-life solution that has life and death implications, and we have a responsibility to those it affects and the passion to make it something that offers several layers of benefits.

I don't think you can run your entire practice that way, but you need to create opportunities in addition to the more standard service work that is the bulk of the profession. It's challenging because you must fund it. We've obtained

some resources along the way through various grants, but we've also delivered an enormous amount of pro bono effort into this, recognizing the importance of this opportunity and believing in the strength of the concept. Our practice has evolved through working on this project. It gives us lessons in both public agency interaction and technical knowledge about water management that informs other work we're doing now and in the future. The real challenge is taking great swaths of the practice into a completely different, vertically-integrated strategy. The place where practices like ours are going to survive is in these areas where you can bring together different kinds of thinking and strategy. That will be where we can provide the greatest value.

CP: The political experience we've gone through with some of our stadium projects has shown us when the stakes are right and the leadership is right, you can accomplish a lot of good things. With the Minute Maid baseball park, we were having weekly meetings with state legislators, city officials and agencies trying to figure out how we were going to put it together. I've seen behind the scenes how the sausage is made, and that has helped guide us into thinking this can really happen. I think we've got a lot of really unique pieces and understandings in here.

DI: How has this project affected the way you might approach your other work (or future work)?

CP: I think there are a lot of firms like Walter P Moore that feel we have an obligation to the communities we serve. Projects like this are part of that responsibility to take these things and try to push them where they need to go. We'll put a lot of extra effort into something we have passion for that we feel has a lot of benefit. I think we would do that again, just driven by the passion that we have for the work we do.

JB: The challenges we're facing today almost make our old way of doing things obsolete across the board. We're talking about a political system in Texas where you're not encouraged to talk about climate change. Yet everything we do as designers is going to be influenced by climate change, and I think it's "malpractice" not to talk about it. At some point you've got to

take a personal stand to decide you're going to talk about it even if you lose the job. That's easy for me to say, but it's very hard for a lot of design and engineering firms to make those statements, particularly when they are financially successful, by saying what needs to be said and not worrying about an obsolete project on the line. The ethical issues that will come to play on this have only just begun to be realized. I think they're huge, but the difficulties of breaking out of this frame are very real.



Everything we do as designers is going to be influenced by climate change, and I think it's "malpractice" not to talk about it.

DI: How do you feel this model might be employed in other contexts by other firms and organizations?

RR: The origin point of the project was Hurricane Ike underscoring a risk that hadn't been understood before, which is a category of programmatic need. When that started, I don't think anyone had any idea of where a solution might come from. The first thing the SSPEED Center did was start building analytical hydrological models to understand that risk before risk reduction propositions could even start.

Looking into our society and our urbanization for things that are evolving in a way we don't understand and identifying ways they should be addressed need to be a priority. We look for these inflection points in our practice as well, trying to find the scale of a situation where you can operate. I don't know that you could ever apply this approach to the commodity side of practice where expectations are so highly codified.

We're still beginning to look at housing emergencies and things like that, but it hasn't evolved away from existing structures. We need completely different models of understanding how, where and why to build housing. Practice can

evolve into these areas. Again, we've had the liberty of time — it wasn't like somebody said you've got to solve this in six months. As a grassroots effort, it evolves, builds and develops its own momentum.

CP: I think the A/E/C industry is the implementer of ideas, but it takes more than just the A/E/C industry to get these things done. We have a lot of masters to serve, and we have a lot of considerations. When we can collaborate with a broader element of entities and bring the environmental groups to the table, we gain a better understanding of their real base issues and the politics of it. We can see some of the unintended consequences and who it impacts when we start looking at what we're doing. That's what the A/E/C industry can learn from this, along with realizing that many times things worth doing take a lot of effort — we can't give up just because they aren't easy.



We need completely different models of understanding how, where and why to build housing.

JB: Many people have told us the modeling we have done on hurricane surge is unrealistic. If we had modeled a storm like Hurricane Harvey before it occurred, we would have been derided. Well, Harvey has happened, so I would say the fact that we have been able to pull this together and it at least has some legs is encouraging. I'm not going to tell you it's going to be built yet; we have a lot of work ahead of us before this

project actually gets to an implementation stage. But it's useful that the frame got broken, and now there is a project combining flood protection, navigation, and recreation and environmental enhancement. If we can build it, that will really be the frame-break. We are pleased to have gotten to the point our creative and effective design is getting recognition. Hopefully the message that's transmitted is that you can find a way to do some things that otherwise seem to be impossible.

Dr. Philip Bedient is Chair and Professor of the Department of Environmental Sciences and Engineering, Rice University, Houston, TX. He is author or co-author of more than 100 articles and five textbooks related to surface and groundwater hydrology and containment transport.

Jim Blackburn is an environmental lawyer and Professor in the Practice in the Civil and Environmental Engineering Department at Rice University. He is also a Faculty Scholar at the Baker Institute and co-director of the Severe Storm (SSPEED) Center.

Charles Penland is a Senior Principal at Walter P Moore. Charlie's special interest in low-impact development, hydraulic design, hydrologic analysis, and flood protection has resulted in his being sought after by a variety of professional, industry and educational organizations.

Rob Rogers, FAIA, is the Founding Partner of ROGERS PARTNERS Architects + Urban Designers, a firm known for blurring the boundaries between urbanism, landscape and architecture. Rob has more than 30 years of experience designing major civic and institutional projects and leads the firm's offices in NYC and Texas.

Power Archive Article | 2017

Designing Water's Future

When we look back at the water planet – that most famous picture taken by Apollo 8 astronauts from the moon – we see beautiful, pristine blue, with swirling white clouds of vapor and massive caps of ice.

And the first thing we seek when we look to the stars is for other circles of blue like us. A rare planet in the “Goldilocks zone” that has water ... and maybe life. Perhaps Proxima Centauri.

But Houston, we have a problem.

J. CARL GANTER

Marooned and alone on a dry, red planet, Matt Damon as Mark Watney in “The Martian” had a profound moment of relevancy.

“If I want water, I’ll have to make it from scratch. Fortunately, I know the recipe: Take hydrogen. Add oxygen. Burn.”

For real-life astronaut Jerry Linenger, who spent five months in orbit around Earth in the space station Mir, each drop of water was precious in his tiny, orbiting ecosystem.

“Looking out the window, I could see the great sources of freshwater on the planet,” he told me. “Lake Baikal. The Great Lakes. The mighty rivers of the world — Nile, Tigris, Euphrates, Amazon. But still, when stepping back and looking at the big picture, not so much different from our little orbiting space station. A closed ecosystem, with only so many sources of life-sustaining water. And all the creatures of Earth, just like the three of us circling it, all dependent on water.”

But today, on this small planet — seen whole for the first time almost five decades ago — we have systemic failure. A global freshwater crisis.

The world’s demand for freshwater is growing so fast that water scarcity is disrupting energy production, triggering food shortages, upending economic development and threatening political stability. The impacts are being felt now in the U.S., which lost a full point of gross domestic product in 2012 due to a severe, ongoing drought, as well as in Asia and the Middle East, where recent droughts and floods triggered serious disruptions, political unrest and epic human migration. The World Economic Forum last year named water crises the top global risk for the planet.

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Most water-related challenges can be solved with hard work. We can break down traditional silos and design more systemically, including the intersections between water, food, energy and climate.

Like Mark Watney on Mars, we need to redesign water's future. Though unlike Watney, it's impractical to make our own water.

Right now, we have small wins and big losses.

In India, groundwater pumps run 24 hours a day, seven days a week to irrigate wheat fields that don't actually need water to grow. We call it mutual assured depletion. In rural areas such as Rajasthan near the Pakistan border, young women walk for hours a day to get water from wells. Some are going dry, and lowest caste families are not allowed to take water from other wells if theirs are empty.

Perhaps the greatest tragedy of the 21st century is that as many as 663 million people around the world don't have access to safe drinking water, and more than 5,000 children die each day from waterborne diseases.

Around the globe, there are ongoing disputes about water rights and allocations.

Perhaps the greatest tragedy of the 21st century is that as many as 663 million people around the world don't have access to safe drinking water, and more than 5,000 children die each day from waterborne diseases.

This is such an important drama playing out across the planet that we must connect the dots, ask the big questions, and go big with design.

Fortunately, water is one of the easiest of our global challenges to talk about because it's the easiest to understand and make personal. You can go without electricity if need be. You can survive for weeks without food. But no one can live more than a few days without water.

Most water-related challenges can be solved with hard work. We can break down traditional silos and design more systematically, including the intersections between water, food, energy and climate, and we can develop solutions that reach beyond corporate fences, political boundaries and status quo pitfalls.

When we fix the water challenge, we fix so many other problems.

When we do bring safe water and sanitation to places that need it, we see remarkable improvements. Children are able to go to school because they don't need to spend hours every day in search of drinking water, which helps break the cycle of poverty and illness. Cities thrive where others collapse. The term wastewater implies "bad," yet where there's waste, there's energy to be captured, new processes and efficiencies to be designed, and water supplies to be re-tapped.

Most water-related challenges can be solved with hard work. We can break down traditional silos and design more systematically, including the intersections between water, food, energy and climate.

But the water crisis is subtle, not sexy. It is slow to unfold, and, until the taps run dry and the crops wither, it's not very relevant to those who have the most power to avert it. Until the water issue becomes dire with flames, floods or tumbleweeds, it's not breaking news.

This critical moment — when the supply-and-demand balance of water, food and energy are colliding — requires a new scale of design-thinking: data, connective narratives, collaborative science, social engagement and accelerated solutions.

Most governments simply are not prepared for the threats that water issues may pose to law, policy and stability. Designers need to play a role, leading by example and making the solutions — and the risks of inaction — visible.

The design community is playing a major role in helping to solve water issues. Yet we need to do an even better job telling the big story and integrating it into every facet of our work, from the built environment to the most basic thinking.



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The practice of water risk assessment is reaching across sectors, especially manufacturing and consumer products. More and more firms are making their products more resilient to water disruptions, reducing their water use, and playing the role of advocate and educator on water issues within their communities. Indeed, those companies that are moving the needle furthest and fastest on water issues have embraced the risks within their supply chains and turned them into competitive opportunities.

But how do we bring governments into the conversations so they, too, start acting systemically and create a positive regulatory environment? Most governments simply are not prepared for the threats that water issues may pose to law, policy and stability. Designers need to play a role, leading by example and making the solutions — and the risks of inaction — visible.

From orbit, astronaut Jerry Linenger said he could watch the dust storms of Inner Mongolia blow across the steppes toward

Beijing and then on to Los Angeles. Water, drought and pollution know no boundaries.

When I went to visit shepherd families where those dust storms began, I found people just like me — people with hopes, dreams and a common value for water. People like Wu Yun, a sheep shepherd's daughter who was watching China's coal mines drain their groundwater and wither their grasslands.

Fortunately, China is changing and they are designing a better water future ... because they have to. They are driving toward water-efficient renewables because they know they don't have the water to sustain their energy needs. (Coal uses a lot of water to mine and to run the power plants.) And they know that climate change is already dramatically affecting their water supplies from the Himalayas.

This is breaking news. Since this story affects each one of us, no matter our country, our government or our station in life, this is no longer an abstract narrative. Every person, like Wu Yun, can see themselves in this picture and begin driving the action toward sustainable water design.

More and more, we realize that surviving, even thriving, in a new waterscape requires us to use the right lenses. We look up for inspiration and hints of life far away. And we look to ourselves on our little blue planet to make connections and design cumulative responses. Design and innovation are built upon optimism, and the greatest designs often occur when we face the greatest challenges.

J. Carl Ganter is co-founder and director of Circle of Blue, the internationally recognized center for original frontline reporting, research, and analysis on resource issues with a focus on the intersection between water, food and energy. Carl is a member of the World Economic Forum Global Future Council on the Environment and recipient of the Rockefeller Foundation Centennial Innovation Award. He was a recent speaker at the Design Futures Council's Leadership Summit on Sustainable Design.

Power Archive Article | 2017

Nine Characteristics for Leadership in Sustainability

These thoughts derive from a presentation I delivered a few years ago at the Design Futures Council Leadership Summit on Sustainable Design.

- Are design firms doing enough to deliver on the promise of sustainability?
- Is our industry losing its momentum in advancing the state of the art of sustainable design?
- Will we ever meet the goals of the 2030 Challenge?
- What is the role of leaders to help overcome these challenges?

PHIL HARRISON

In answer to the last question, I propose that there are nine characteristics of leadership necessary to achieve serious advances in environmental performance for our built environment.

Ignite change. The first thing to do is to start. Certainly, think a little before you do. But if you want something to change, you have to start it, like a spark lighting a flame. All too often leaders spend countless hours and dollars considering plans and making studies of possible actions, seeking assurances that their efforts will not be wasted. Prudence is indeed an important leadership trait. However, when confronted with

something as important as sustainability, there is no time to waste. In addition, there are so many things that can be done right away that there is no compelling reason to wait and consider. You can start with easier things first, demonstrate commitment, and prove that progress is possible, thereby creating momentum that will be important for more difficult challenges in the future.

Leaders need to convey a sense of urgency. Actions will express this; talk by itself will not. Visible and tangible actions and a spirit of urgency will infect an organization and are necessary ingredients to any real change.

Set conditions and priorities. Just as soon as they start, leaders need to communicate the importance of the change they are advocating. There can be no doubt that this change is critical to the future success of the organization, that it is an extremely high priority. In addition, they have to create an enabling environment for the change to take place in their organization. Any other organizational objectives need to adapt to support the change and certainly not conflict with it.



Visible and tangible actions and a spirit of urgency will infect an organization and are necessary ingredients to any real change.

For example, performance metrics should be modified to account for the new sustainability objectives. Operational behaviors need to likewise adapt. Obviously, a firm that talks about sustainability but serves coffee in Styrofoam cups will not be taken seriously. This carries through to all levels and details of the organization and carries tremendous symbolic weight.

Finally, as the change initiative progresses, active management of the organizational environment will be required to make sure the growing effort progresses unimpeded by other organizational forces. In other words, leaders need to clear the way for organizational change and remain actively involved in preserving an environment for ongoing developments.

Have direct personal involvement. There is no better way to communicate a sense of urgency and importance than direct involvement. This means showing visible support, direct knowledge, and passion for the problem at hand. Why should an organization take an effort seriously if the leader does not appear to take it seriously? Leaders need to be in the front row of change, and the more they are seen to be early advocates of the change, the more quickly the change will take place.

Further, this point relates not only to the head of an organization but to the entire leadership group of the organization. If the CEO is passionate and involved but the rest of the firm's leadership seems lackluster, then change will come very slowly, if at all. Part of the leader's job is to recruit the entire leadership team to actively support the effort. This is one of the most difficult challenges on this list because established leaders tend to have the hardest time adapting their mindsets. They have been successful the way they have always worked, so why change now? It can take some serious effort to convince these established leaders to join in the change initiative, but it is essential. In fact, a leader's goal should be to have 100% active support from a leadership team. Leaders should consider significant changes to their team if they cannot achieve this goal.

Get out of the way and let go of control. While it is important for leaders to be directly involved, it is just as critical to give control to others and empower them to lead the charge. The leaders of organizations almost certainly will not be the

most expert people to lead change initiatives on a daily basis. They must remain visibly involved, but they should not try to control the effort. In fact, leaders need to have a high degree of confidence in their organization's ability to drive change. Letting go of control means being prepared to accept a relatively high degree of volatility, uncertainty, complexity and ambiguity (or VUCA, as they say in the U.S. military).

The average design firm spends 15–20% of net revenues on marketing, staff development and technology alone.

Big and difficult problems need comprehensive and diverse solutions, and these types of solutions are unlikely to originate from a single person or point of view. Complex solutions come out of complex networks or systems. Leaders need to realize that the richness of an organization's collective brain trust will most likely come up with the best solutions to the immense challenges of sustainability, and they need to allow this system to do its work.

Change your attitude of risk. Along with letting go of control, leaders need to develop new concepts of risk. Traditional risk management methods rely heavily on isolating areas of risk and exerting control in these areas to minimize them. The problem with this approach is that it tends to define things through exception or describe things that should not happen. When change is urgent, the greater risk lies in inaction, and the process of isolating and controlling risk simply causes progress to slow or even stop.

Rather than tightening a management collar in the area of change, it is far better for leaders to loosen their grip and accept VUCA in a more dynamic, changing environment. As with getting out of the way and letting go, leaders need to have a high degree of trust in their organization with regard to risk management. If they have done their work at the highest levels of the organization — set a vision, communicated priorities, established a thriving culture — then they need to trust that their organization will function at a high level and will do good work. This trust/performance relationship is self-reinforcing. The more trust and the better the results, the more likely that future organizational risks will turn out successfully.



Leaders need to be in the front row of change, and the more they are seen to be early advocates of the change, the more quickly the change will take place.

Free up resources for investment. Eventually, firms need to be willing to spend some money to make change occur, but in this economic climate it can be especially hard to take on new financial commitments. So the key is to think of this commitment as an investment alongside other existing financial commitments. The average design firm spends 15–20% of net revenues on marketing, staff development, and technology alone. Leaders should constantly evaluate the benefit of these and other investments, considering the reallocation of resources to areas that are priorities.

New initiatives do not necessarily have to be added to existing overhead structures, causing them to be perceived as additional burdens on the organization. In fact, it is liberating to realize that you can do a lot with a modest amount of resources, especially when it comes to new efforts. The more leaders highlight the importance of an effort and build excitement around the effort, the more likely they can do

more with less. It is possible to fund real tangible change with a fraction of 1% of revenues. Consider realizing 10% efficiency in marketing, staff development and technology, and free up half the savings for new initiatives, letting the rest go to the bottom line.

Listen, engage, then share. The challenges of sustainability are immense; leaders must realize that they cannot go it alone in overcoming those challenges. One of the most compelling dynamics of the sustainability movement over the past 10 years has been the way it has functioned as a system. The progress we have made to date is a result of extensively collaborative efforts. Meanwhile, proprietary efforts have been much less successful because they have had too narrow an impact.

A new concept of intellectual property is emerging along with a new understanding of what it means to work effectively within a system. Three important characteristics are listening, engagement, and sharing. With so much going on in the sustainability movement, it is critical to listen so that you can understand what is out there. I strongly encourage leaders not only to keep up with the mainstream press but also to read blogs and follow Twitter feeds. Many leaders might say they do not have time; however, it's not necessary to read everything or attend every conference. Listening is a state of mind and a series of actions that culminate in an overall awareness of the public conversation. Just like freeing up resources for investment, leaders should free up some of their time to listen to the public dialogue on sustainability. This is the first step toward being part of the system.

The next step is engagement. This means personally and organizationally engaging in the public dialogue. There are many venues to do this, so pick some key areas of public engagement and make them count — engage, form relationships, speak, write, blog or tweet.

Finally, forget about the concept of proprietary knowledge, and share what you have. What good is knowledge that is not used? For knowledge to be relevant it needs to be exercised. It is critical for leaders to encourage active sharing of knowledge at all levels of their organizations, both between internal groups

and to the public at large. These three actions — listening, engagement, and sharing — help make the system thrive. And they make your participation in the system relevant and noticed.

Have specific and tangible short- and long-term goals.

Clearly articulated goals are important, and the leader needs to communicate these goals frequently. It is critical to understand the importance of both long- and short-term goals. Long-term goals need to be audacious and passionately communicated by a leader; short-term goals must be visibly achievable, quantifiable and realistic. The leader needs to have the courage to be visionary while at the same time remain pragmatic and demand accountability.

Because the challenges of sustainability are significant and diverse, it is important to break down the overall problem into smaller pieces and then consider the type of leadership response for each piece. For example, the challenges for environmental toxicity are very different than they are for energy use.

Materials scientists have been very successful over the past 10 years, and we now can design buildings without any toxins, thereby creating dramatically healthier environments. Perkins and Will's publicly available online tool helps designers understand the pragmatic details of appropriate material selection. And yet, most buildings are still designed with toxic materials because design firms have not made the simple decision to eliminate all toxic materials. In this case, the leadership proposition is clear: Leaders can create mandates for their organizations to eliminate all toxins from their designs. This is a short-term, measurable and relatively easy action.

Meanwhile, the challenges of energy reduction are much more difficult. The objectives of the 2030 Challenge are necessary and yet extremely difficult to achieve. Those organizations and cities that have signed on to the challenge should today be building all their projects to use 60% less energy than the baseline. There is little question that this goal is not being met, and the goal will become more challenging in a few years. In this case, the solutions are not generally available, and so the

leadership proposition needs to be different since simple mandates will not work. Here, leaders need to enlist the creative energies of their organizations to get to work earnestly on energy efficiency solutions at every level of scale and detail, and these challenges need to be appropriately stated as long-term aspirations.

Establish and articulate the purpose. The ultimate motivation for any group working on solving difficult problems is an understanding of the larger purpose of this work. This is especially true in the context of a system. A clearly stated purpose can span the multitude of efforts that altogether make up the collective effort and can have the effect of aligning these efforts to work in concert.

Leaders must see their role as defining and articulating the purpose for organizational change. Teams are motivated by purpose. We have learned from author Daniel Pink and others that understanding purpose can drive high performance much better than negative reinforcements. The millennial generation is particularly socially motivated and will respond strongly to clearly articulated purposes that contribute to social well-being.

Finally, leaders should understand that different groups may articulate their purpose in different ways but that the actions that support one purpose may support an allied purpose. In the sustainability movement, different groups focus on subsets such as solving global warming or establishing energy interdependence, but the actions to support either purpose will be very similar. Listening to the public discourse on sustainability allows leaders to understand the purposes that motivate different groups and then connect to those groups in meaningful ways. This understanding that varied purposes can motivate varied groups to align their efforts and achieve common results is one of the most powerful forces for leaders to tap into.

Phil Harrison is the CEO of Perkins and Will, where he is responsible for the firm's strategic focus and business performance. He is a senior fellow of the Design Futures Council.



Power Archive Article | 2017

New Questions, Different Thinking, Positive Impact: Start at Zero?

Think about this for a moment: When the kindergarten students of 2017 are college freshmen in 2030, what will the world be like? Will they have a bright, clean energy well and a health-focused world? Will we have done anything substantially different so that they have a better future?

PATRICK THIBAUDEAU

By changing the questions we ask, we can change the way we think about what is possible. This article presents some new questions to consider and some examples that show what we can do now to impact the future.

New Questions – Start at Zero?

It's time for a new approach, a new way of thinking and living. What if every morning we start the day at zero and work throughout the day to have positive impact? If we use zero as our constant baseline for living, then zero would be the worst we did instead of our best. Thinking this way can help us go beyond traditional incremental improvement, which amounts to "less bad" outcomes, and move toward more positive outcomes.

How does this work? Take zero net energy, for example. The current approach establishes zero as the end point and best-case scenario. But if we start at zero instead, a design team would get no energy budgeted until the natural resources available are optimized using passive strategies. Then, when energy is needed, it is budgeted sparingly while calculating how much energy can be made onsite or nearby.



Gone are the days when sustainability costs too much.

Starting at zero leads to compelling questions like these (adapted from ARUP's "Drivers of Change"):

1. What will the world be like in 50 years?
2. What will have the most impact on the future?
3. When is constructing a building better than no building?
4. What's next after computers?
5. How will mega-trends affect the built environment?
6. What if there is no front to a classroom?
7. What if we could work from anywhere?
8. What if healthcare focused on wellness?
9. When do we need to gather and for what activities?

Hundreds of participants around the country have responded to these questions. These participants included design professionals, business and government executives, educators and building occupants. The top responses, which were gathered from surveys, interviews and workshops, are listed below in order of impact.

1. Mobile technology and devices
2. Freshwater access and awareness
3. Climate change
4. Renewable energy
5. Energy infrastructure
6. Human activity impact
7. Connection to natural world
8. Intelligent buildings
9. Food production
10. Consumption and waste

Three guiding principles have emerged from this research that lead to a holistic approach to positive impact. These three principles are not limited to buildings only but also influence daily living.

- 1. Human experience
- 2. Target performance
- 3. Best value



What if we could ...

- 1. Restore the health and wellness of people and the health of the land?
- 2. Make energy without fossil fuel? And make more than we consume?
- 3. Clean the air, not just make it less dirty?
- 4. Live in water balance with water resources?
- 5. Eliminate waste?
- 6. Have a circular and selfsustaining economy?
- 7. Focus on abundance and prosperity rather than expense, cost and scarcity?

Positive Impact on People

What benefit is a building that is net zero energy or carbon neutral if it's not also a good place for people? Not only does the building fail in fulfilling its core purpose, but it also will not last.

For a positive impact on people in education settings, for instance, we can ask questions like these: How will learning take place in the future? What if there was no front to the

room, then what would learning look like? When will learners need to gather or be alone, and what kind of spaces will they need? Across the country, the learning experience is being transformed in university and community college science classroom buildings.

In healthcare, what if we change to a wellness approach rather than just an acute care approach? Then, designing the health care process first yields better healthcare and a very different building. Health systems across the country are changing to this approach, including recent projects in California, Wisconsin and Georgia, to name a few. And more of these projects are underway.

Another category to consider, mobile technology, is changing the look, feel and manner of work in office buildings. Designing a new way of working based on mobile technology and positive impact is the new normal at offices in Palm Springs, Buffalo, Minneapolis, Sacramento and other cities across the country.

Positive Impact on Our World

In addition to a positive impact on people, some projects are leading the way in positively impacting the world. For example, how can buildings not only use less energy but actually produce it? One college campus in an extreme northern climate abandoned the carbon-emitting central plant, built a new cutting-edge biomass gasifier, and installed two utility-size wind turbines. Besides achieving net zero energy performance in 2013, they provide carbon offsets.

Another college campus, which is located in California, currently produces 13 megawatts of electricity. And a community college science complex has been operating at net positive electricity since September 2015.

What about air? Can we actually clean the air rather than just make it less dirty?

Consider the fact that one existing building uses energy that produces annual emissions equal to the annual emissions of about 191 cars. But on the other hand, one Midwest health

campus has reported being carbon neutral for utility emissions. A building in an extreme northern climate is net carbon positive.

Can we achieve water balance? What will we use the water for when there's not enough? By starting at zero for water use, one facility that was using 2.2 million gallons was shown to potentially use only 150,000 gallons a year. An office building in the desert of southern California was allocated 20 million gallons by the local water authority. Instead of status quo, the new office building was designed to use less than 2 million gallons a year. This building is planned for net positive water. The extensive landscape was designed for near-zero water and is also a beautiful design. An engineered wetland was installed to treat wastewater onsite. Drinking water needs were prioritized and non-essential water uses were eliminated, such as using hand sanitizer instead of hand-washing. Finally, extremely low-water-use fixtures and water-free cooling systems were installed.

Can we eliminate even the idea of waste? Without trying very hard, one project achieved 98.4% diversion of the construction waste from the landfill. So nearly all the material that would have been sent to a landfill is being used again. About 65 communities around the world have adopted zero waste plans or goals.

Can we copy nature by eliminating toxins? One exterior paint that was designed to mimic the surface of a lotus leaf and be self-cleaning and has been used on various projects. One

hospital decided to select materials for interior finishes that did not contain Red List chemicals with only a few exceptions. Efforts like these are transforming manufacturers, some of the world's largest producers of toxins.

Financial power can accelerate transformation. One large worldwide lender has become interested in financing companies' efforts to be more sustainable.

Gone are the days when sustainability costs too much. In "Confessions of a Radical Industrialist", Ray C. Anderson writes about companies that have lower energy use and lower carbon emissions ... and they also have higher sales and better profits.

Children are invested in making the world better. A fourth-grade class in California did a science project on renewable energy. Not only was their project accepted for presentation at an international renewable energy conference, but the fourth-graders themselves presented it.

The class of 2030 does not yet know the word *can't*. We can adopt that mindset too. Let's change the questions we're asking, think differently about what's possible, and press forward with courage and conviction. We can give them a better future now.

Patrick Thibaudeau – LEED FELLOW, CCS, ILFI – is vice president of sustainability at HGA.

Stop Going Round in Circles About the Circular Economy

As people around the world increasingly question our impact on and relationship to the physical environment, so too should those who design how we live and work within it. With thoughtful planning, collective efforts and careful attention to the life cycle of materials, sustainability in the A/E/C industry could be closer than we think.

JOËL ONORATO

Close the loop. Circular cities, buildings, clothes, food. Re-something. Something-cycle. Salvaged barns, shoes made from plastic bottles, no more seabirds stuck with caps in their stomachs. Even better, make it from crop waste, completely compostable, biodegradable. And what about mushrooms?

Now, back to your excel sheet, BIM model, contract, or phone call with this flavor in your mouth. It's not as bitter as the news about how warm these years have recently been or the current loss of biological species. It has some futuristic taste to it — yes, an optimistic one. Good ideas you will talk about in that meeting, everybody will get what a circle is. And then? Maybe we can put that in next year's sustainability goals ...

Why does the circular economy feel beyond reach? For two fundamental reasons. First, it requires us to consider the very aspects we have kept out of sight: the extraction of resources, the production of goods and the accumulation of waste. This is driven by the second, larger reason: the circular economy requires a systemic transformation of our whole economy, which is based on the opposed linear take-make-waste approach.

So how can we make this transition happen? Like any overwhelming task: break it down, understand what it is all about, convince ourselves it is the right way to go, and proceed with strategic and collective steps.

Not just circling for the sake of circling

To put it simply, the circular economy is a framework where materials are perpetually kept in use to achieve three goals: minimizing extraction of finite natural resources, eliminating waste, and minimizing or even turning negative environmental and health impacts into positive ones — in short, make the material aspects of our lives sustainable.¹

Keeping materials in use means preserving the maximum value of each thing that has been produced for the longest time possible. Reuse it as long as you can (give it to another user or share it). Repair it if you can't reuse it as is. Or, if it has too little value, then remanufacture it (turn it back into something with an as-new condition). At worst, break it down and recycle each material (or compost it) for another future use.

Business opportunity today, risk tomorrow

The powerful aspect of this framework is that it focuses on value; it is not just a circular moral imperative that can be eluded, as the one for sustainability sadly still is. It is a new economy — for the 21st century. From the World Economic Forum to consulting behemoths like Accenture or McKinsey, by way of global companies like Caterpillar or Ikea, many stakeholders are understanding why the circular economy can make great business sense today and future-proof their growth.²

Raw materials are finite and facing ever-rising pressure due to the increase in the world's population and the strengthening

purchasing power of a number of countries — their prices will very likely rise and be more volatile.

At the other end of the production process, people — citizens, customers, investors, communities, governments — feel the urge to act and behave more responsibly towards their environment, becoming increasingly aware of the burden of industrial activity, but also of waste.

Maximizing the use of things can also be an opportunity to intensify manufacturers' relationships with their consumers. For instance, Philips Lighting, the world's largest lighting manufacturer, offers "Circular Lighting" as a professional service. Users, such as Amsterdam's Schiphol International Airport, pay only for the light that is used rather than purchasing their own lighting equipment. Philips owns the equipment and takes care of the operation, the maintenance, all future technology updates and the end-of-life management.³

What about the building industry? It is growing and will only continue to expand with cities and population growth. It encompasses a very large array of different things, from concrete to carpets, by way of air ducts and elevators. So far it overlooks the impact of materials — roughly 10% of global carbon emissions⁴ — concentrating often exclusively on energy-efficiency. And it deals with many finite materials while wasting enormous quantities of them.

The circular cities of tomorrow

Let's imagine: In a circular building industry, deconstruction would be the norm and as minimal as possible. Unused materials and components would not impede any landfill. Rather, they would enter a vast market ranging from salvaged components to recycled and renewable materials. Any hazardous or harmful material would have been phased out. New products would be made to last: easily repairable and upgraded, remanufactured, and eventually recycled or composted. Buildings would be assembled to allow each of their parts to smoothly enter the circle again.

Spaces would be flexible, used and occupied intensely. At any time of the building's life, one could know the state of its

components and so plan for timely maintenance. Parts of the building, like the structure, would be owned for long periods of time. Others (partitions, furniture, carpet tiles, curtain wall façade modules⁵) would be leased and upgraded according to the user's needs. Each owner would consider his property as being a profitable material-bank.

To accelerate the transition towards such a future, there are already attitude-shifts and actions that can be carried out today. Owners have good reasons to make upfront choices improving the circularity of their projects. Designers, whether architects or engineers, can design and specify differently — often with minimal impact on the project budget — and advocate for change. Manufacturers and builders have an opportunity to cut on materials, construction and waste-management costs, while securing a strong position in the market. Each stakeholder should build up a strategy to capture the value of materials and components that the circular economy enables them to retain.



To put it simply, the circular economy is a framework where materials are perpetually kept in use.

Good for the bottom line

Admittedly, because the linear model of production is the dominant one, it seems likely that any deviation from it would increase risk and costs. However, because of the complexity of real estate developments and the nature of the circular economy (which looks at previously unexplored value), there are situations where this common sense can be proven wrong.

Construction costs can be reduced by making the most of what exists on site — buildings, structure, spaces and materials. When preserving is not an option, donating building components coming from deconstruction to non-profit re-use centers can result in significant tax deductions on top of

avoided landfill fees. Meanwhile, Materials and Resources LEED credits can be earned.

Deconstruction has many benefits, especially for refurbishments such as façade upgrades or interior commercial remodeling. In the 101 East Erie Street office conversion project in Chicago, for example, deconstructing 220,000 square feet of ceiling tiles to be recycled by the manufacturer saved three weeks in trade coordination.⁶

Deconstruction can also be a tool for community outreach. In urban areas, deconstruction drastically reduces noise and dust. It can also be a way to invite the community to participate in the transformation of the urban fabric, either by training the local workforce in deconstruction or by involving the community in the strategies for the reuse of materials. The prolific work of Theaster Gates⁷ or Rural Studio⁸ could serve as inspiring examples.

Finally, a circular building allows for a swifter maintenance, as well as efficient modifications to space layout, systems and envelope.

Design for circularity – materials and components

For designers, the very first step is to inform any material choice by an idea of what happens before, during and after its use. Based on this knowledge, prioritize existing and salvaged materials over repaired or remanufactured ones, remanufactured over recycled or bio-based ones, and recycled over those made with virgin materials.⁹

Take wood: Reusing a wood component increases its capacity to store carbon,¹⁰ as its end-of-life (when the carbon is released) is postponed. This reuse can take many shapes. In Georgia Tech's Kendeda Building, for instance, nail-laminated floor decks smartly incorporate salvaged wood boards sourced from a local re-use center to act as non-structural spacers between virgin boards.¹¹

For structural steel components, recycling is by far more common with an 85% recycle rate,¹² which can in return be required in the specifications. In contrast, concrete, when

not reused, is most often down-cycled and used as road base or construction fill. Its impact can be mitigated, though, by reducing the embodied carbon.¹³



Prioritize existing and salvaged materials over repaired or remanufactured ones, remanufactured over recycled or bio-based ones, and recycled over those made with virgin materials.

Façade glass is also down-cycled, crushed, and used in aggregates in road construction, if it does not end up in a landfill. Instead, it could at least be recycled, as the Verde SW1 project in London led by Tishman Speyer and Arup shows.¹⁴

Inside the building, manufacturers of carpet tiles and suspended ceilings very often offer more or less virtuous take-back programs, which are easy to specify and implement. Partition walls, changing along with space needs, could greatly benefit from being circular. And yet, despite the performant design of modular office walls, they are not managed in a circular way.¹⁵ They also can't compete with drywall partitions, which suffer from contamination — especially from paint — resulting in low rates of gypsum recycling.

Overall, beyond informational Environmental Product Declarations (EPD), certifications such as Cradle to Cradle or Living Product Challenge can help guide the designer's choice. Attention should be paid to the certification level, as the Cradle to Cradle label alone, for example, provides no guarantee that the products are not actually still cradle-to-grave.

One last principle: Keep it simple. However banal or generic this may sound, it helps ensure components will ultimately be recycled. This entails avoiding composite materials, privileging

low-tech — if not passive — systems, minimizing finishes and coatings, and limiting the overall number of different materials.

Design for circularity – assembly

How the building is put together matters just as much. Buildings should be designed for disassembly to allow cost-effective reuse, repair, upgrade, remanufacture and recycling of their parts.¹⁶ At a large scale, the different layers composing the building should be easy to separate and not hopelessly entangled: the structure, the skin, the services (MEP and others), the space (partitions, floors, ceilings), and the stuff (lighting fixtures, furniture, ICT).¹⁷

Any connection should be reversible and accessible, not jeopardizing the reusability of its components. For steel, this means minimizing welded connections and using bolted ones or clamping profiles together, like the Lindapter products or the ConXtech system. Current binders used in wet trades, such as cement-based mortar, constitute an obstacle to reversibility.

Finally, materials and components should be appropriately marked to avoid unnecessary down-cycling or disposal, as with a glue-laminated wood beam, for example.



Circulating things and designing them
to circulate does not directly address
the reduction of their footprint or their
regenerative capacity.

Towards a full circle

The circular economy is more resistant to, but not immune from, the usual pitfall: Whereas resource efficiency and eliminating waste are likely to be embraced by businesses in the near future (since they closely relate to economic value), there is the risk that the rest of the environmental and health

impacts will be overlooked. Upon further consideration, the definition of the circular economy itself includes this flaw: Circulating things and designing them to circulate does not directly address the reduction of their footprint or their regenerative capacity.¹⁸ This is why each circular initiative should be valued by its success in tackling *all three* goals: minimizing resource use, waste production, and health and environmental impact.

That being said, even if the circular economy is not the holistic solution to all our environmental problems, it is a very powerful framework. Implementing small changes immediately while raising awareness and commitment collectively will gradually lead to innovations in business models, materials and design, eventually reaching full circularity. Yet such a transition might not happen fast enough. Legislation is urgently needed to support it and foster significant change in the coming years.

¹ The Ellen MacArthur Foundation provides a more thorough definition with three principles. Principle 1- Regenerate natural systems: Preserve and enhance natural capital by controlling finite stocks and balancing renewable resources flows. Principle 2- Keep products and materials in use: Optimize resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles. Principle 3-Design out waste and pollution: Foster system effectiveness by revealing and designing out negative externalities.

² See for instance the research from Accenture: Peter Lacy, Jakob Rutqvist, “Waste to Wealth: The Circular Economy Advantage”, Palgrave Macmillan UK, 2015.

³ http://images.philips.com/is/content/PhilipsConsumer/PDFDownloads/Global/Case-studies/CSLI20170418_001-UPD-en_AA-Case-Study-LaaS-Schiphol.pdf

⁴ According to Architecture 2030, based on the UN Environment Report of 2017 and EIA International Energy Outlook, building and material construction contribute to 11% of global CO2 Emissions. Building operations account for 28%.

⁵ This is actually a research project at the university TU Delft in the Netherlands <https://www.tudelft.nl/en/architecture-and-the-built-environment/research/projects/green-building-innovation/facade-leasing/facade-leasing-pilot-project-at-tu-delft/>

⁶ Case study mentioned in Armstrong's ceilings recycling program: <https://www.armstrongceilings.com/commercial/en-us/performance/sustainable-building-design/ceiling-recycling-program.html>

⁷ <https://www.theastergates.com/>

⁸ <http://www.ruralstudio.org/>

⁹ See the Carbon Smart Material Palette from Architecture 2030 for a detailed understanding of how to mitigate the impact of several building materials, especially in terms of carbon emissions.

¹⁰ The storage assumption is based on sustainable forestry. Beyond the balance of trees, such forestry is even more so important, as forests as a whole (including leaves, branches and soil) store much larger quantities of carbon as the wood products themselves.

¹¹ <https://livingbuilding.kendedafund.org/2017/12/06/nail-laminated-floor-deck/>

¹² According to the World Steel Association. The rate drops to 50% in the case of household use. When recycling special alloys, their value is often lost.

¹³ Reducing the carbon impact of concrete can be achieved at least in three ways, with little or no consequence on the project's budget: using Portland-Limestone Cement instead of ordinary Portland cement; minimizing the cement content, either by design or by replacing it partly with safe

components like fly ash; or leveraging the natural carbon sequestration of concrete by using technologies like Carboncure at the construction stage.

¹⁴ In collaboration with British Glass. See also Arup's report about construction flat-glass recycling available online: Arup, Graeme DeBrincat, Eva Babic, "Re-thinking the life-cycle of architectural glass".

¹⁵ Some companies like Steelcase are researching the concept.

¹⁶ For detailed strategies for Design for Disassembly, see B. Guy, G. Ciarimboli, "Design for Disassembly in the built environment: a guide to closed-loop design and building", prepared for King County, WA., available online.

¹⁷ To use the concept of building layers from Stuart Brand.

¹⁸ Some 'circular' initiatives can have an overall negative impact as repairing, remanufacturing, and recycling can be transportation, energy and water-intensive processes. Opening undiscovered markets could in some cases lead to more pollution.

Joël Onorato is an architect and structural engineer, working at Hickok Cole Architects in Washington, D.C., where he is leading a research project on the circular economy. Previously, he was working in Paris, France, on bridge design, mixed-use projects and urban design, while researching on the theory of digital architecture.

State of Play in Green Design in Australia

DFC contacted leaders across the sustainable design community in Australia. We questioned the community about the state of play in green design in Australia. DFC members were surveyed regarding a wide range of topics.

With an increased social awareness of the ecological crisis at hand, we had anticipated that the request for sustainable design services would have increased. Remarkably, this assumption was correct. Sixty percent of respondents reported an increased demand for green design; the remaining 40% said the demand for services stayed the same. While these figures paint a positive story, responses from leaders demonstrated frustration with the pace of change. The responses could be grouped into two key areas of concern and opportunities for improvement:

1. A pool of evidence is needed to persuade clients.
2. Australia is not keeping up with international pace.

The value proposition for capital investment at the development stage and the operating cost impact to the longer-term asset owner are misaligned through the typical processes of project delivery and also our current understanding of how to on-sell design.

Past sales data and design trends provide insight into the value of aesthetics, floorplans, materials and other design features to the ultimate end consumer/buyer; however, within the space of green design, it is currently not as well understood what the market will absorb.

This begs the question asked by Brendan Pope of Fleetwood: “How do you bridge the gap between these two entities when their drivers aren’t the same?”

An understanding of the ROI for green design technologies for the ultimate end user should be on-sold from the design stage. As stated by Jake Fernanda of McGregor Coxall, there is a call to arms for the industry to openly share “concrete evidence of the plethora of associated benefits, including consumer preference of such design/technology. This could then be relayed to said consumers for their understanding of upfront and ongoing costs.”

“The Lucky Country” is not keeping pace with international leadership in green design/climate policy. Across all areas of the green design and climate policy spectrum, Australia is lagging. Survey respondents expressed a desire for our country to respond to the issue at an international level, learning from and following global leadership.

Climate change is a long-term, global problem. Long-term problems generally require stable but flexible policy implementation over time. However, Australia’s commitment to climate action over the past three decades has been inconsistent and lacking in direction, with Australia erratically altering



Across all areas of the green design and climate policy spectrum, Australia is lagging.

course at times. Our lack of political leadership causes angst, which has a direct impact on green design/climate policy. While there is still a cohort peddling throw-away lines about government needing to demonstrate leadership, one would argue that ship has sailed, and the argument is pointless. Sadly, as history has proven, the design of some governance systems leaves a fundamental gap in the ability to objectively implement the policies required. Firms would do best to identify with a new role as the leaders who are required to educate government and hold them to account. As the custodians of the built and natural environment, we are best placed to lead, and must be in a position ourselves to argue the validity of international precedence and lead by example.



As the custodians of the built and natural environment, we are best placed to lead, and must be in a position ourselves to argue the validity of international precedence and lead by example.

Alexia Lidas is an advocate, researcher and strategist within the built and natural environment. In 2017 she brought global built environment think tank, DesignIntelligence and the Design Futures Council to Australia. As the built environment faces rapid change, Alexia felt the industry needed a vehicle for multidisciplinary, strategic and future-focused discourse. She is a current Director of built environment advisory and professional development firm Metis, which specialises in assisting public and private sector built environment professionals with a wide variety of issues in the sector. Prior to launching Metis and DesignIntelligence, she led industry association Consult Australia NSW, representing members' views on issues such as procurement, contractual terms, infrastructure financing, diversity, BIM, technology, community and stakeholder engagement. Alexia is a past Board Member of the Australian Smart Communities Association. A passionate advocate, collaborator and strategist, who enjoys connecting industry with ideas, and for this reason she is a regular contributor to industry forums.

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Design Futures Council Australia

"The DFC is crucial to expanding the discourse around innovation and business development in the A/E/C industry. The DFC understands the changes that are happening, and is able to strategically connect diverse players in the industry towards a shared goal of advancing the industry. It is critical to the positive future of the built environment that the DFC emerges as a significant voice, and platform, in Australia."

Tristan Morgan, National Design Technology Lead: Innovation, Cox Architecture





2019 Leadership Summit Events

Each year, the Design Futures Council gathers together around a series of essential themes ruddering the A/E/C industry. The gatherings are always titled as leadership summits or forums. Each gathering is attended by leaders from property development, architecture, design, engineering, construction, finance, banking, building product manufacturing, academia and more. The overarching goals for these exchanges are:

- Relational connectedness among attendees.
- Challenging the status quo of design and delivery.
- Presentation of thought-leading content that alters perspectives.
- Staging the questions every industry leader should be asking.
- And more.

The schedule of DFC events for 2019 is:

DFC Leadership Summit on the Dynamics of Accelerating Convergence

October 15–17 (London, UK): At the International Leadership Summit on the Dynamics of Accelerating Convergence, we will look at how the industry and professions are moving toward each other and exhibiting crossover — of skills, of ideas, of processes — creating greater value for the built environment and the world.

Leadership Summit on the Business of Design

November 11–12 (Cambridge, MA): Each year, the Design Futures Council convenes senior executives from across A/E/C to explore essential issues of strategic importance to running a better business.

AUSTRALIA | Extended Value in Practice

October 1 (Sydney, AU), October 2 (Melbourne, AU): How do we expand the reach and role of architects and engineers in the built environment beyond current practices to deal with challenges and complexity facing the economy, society and the environment?

AUSTRALIA | Deep Dive into Global Trends

November 1 (Sydney, AU), November 8 (Melbourne, AU): Today's businesses, government and individuals are responding to shifts that would have seemed unimaginable even a few years ago. These are large, transformative trends that define the present and shape the future by their impact on businesses, economies, industries, societies and individual lives — with 'global reach, broad scope, and a fundamental and dramatic impact.' Take a look into how the on-flow will impact the built environment, and therefore our services and businesses.

Notable Quotes

Rem Koolhaas

“Criticism per se does not worry me. I’ve always solicited it as part of the design process.”

“A building has at least two lives – the one imagined by its maker and the life it lives afterward – and they are never the same.”

“Sustainability has become an ornament.”

“Find optimism in the inevitable.”



Adrian Parr
Dean, College of Architecture, Planning and
Public Affairs, University of Texas, Arlington



David Dewane
Architect, Publisher, Journalist, Educator



Bob Fisher
Managing Principal, DesignIntelligence
Strategic Advisors



Sandy Mendler
Principal, Mithun



Leadership Summit on the Future of Environmental Responsibility

September 9-10, 2019
Minneapolis, MN



Dave Gilmore
President/CEO DesignIntelligence



Jonathan Salk
Co-author



Charles Penland
Senior Principal, Walter P Moore

Rob Rogers
Founding Partner, Rogers Partners

Jim Blackburn
Professor, Civil and Environmental
Engineering, Rice University

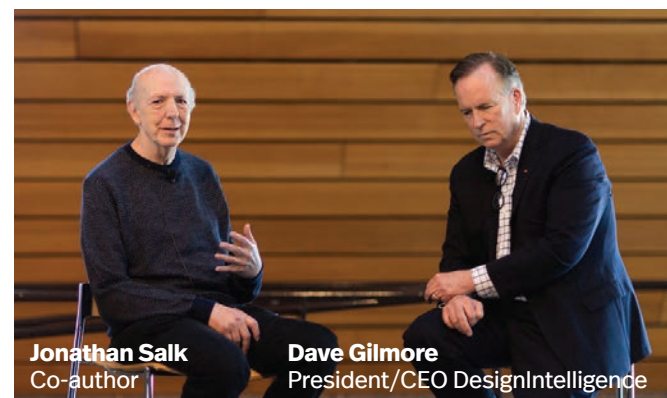
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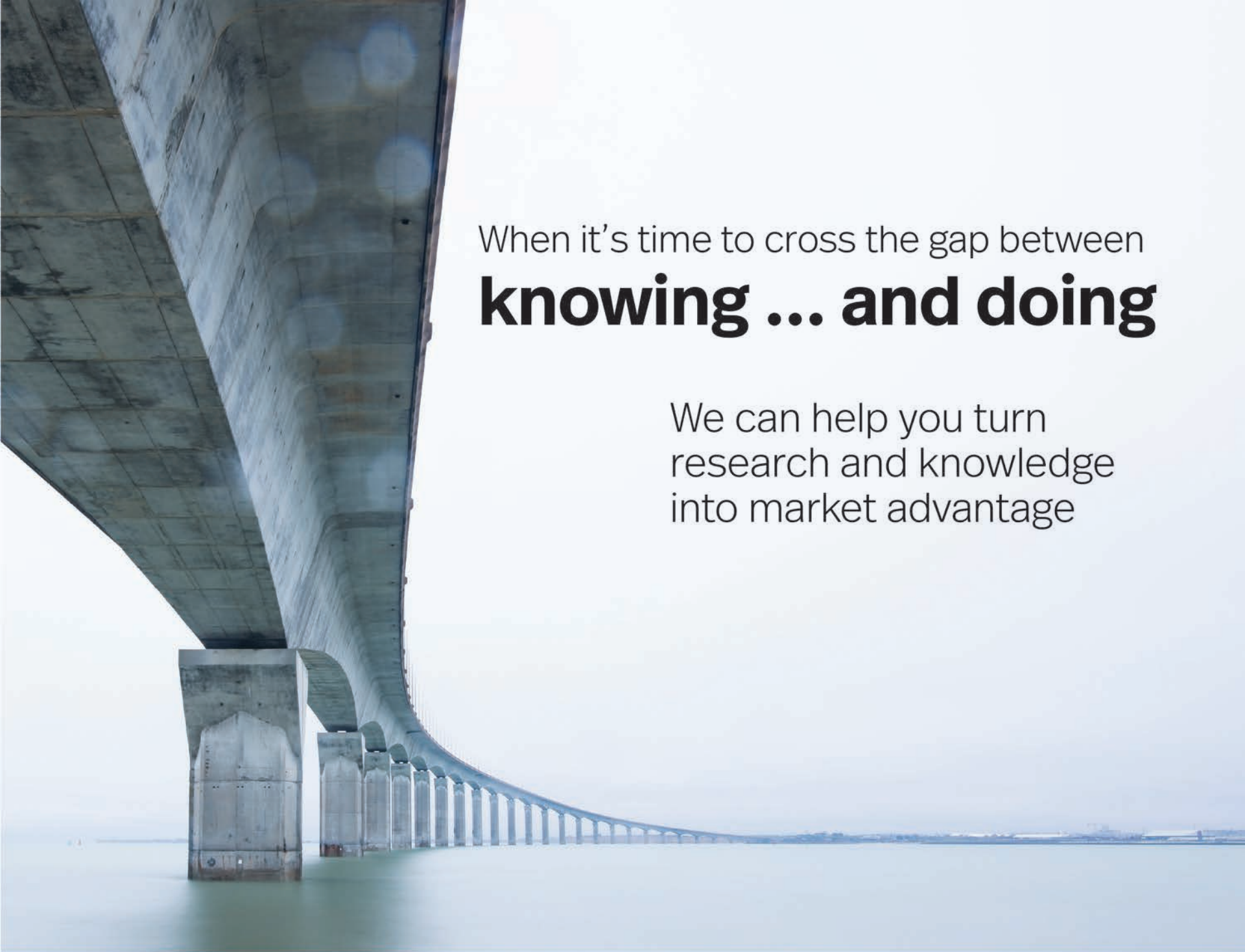


Jonathan Salk
Co-author

Dave Gilmore
President/CEO DesignIntelligence



Mitchell Joachim
Co-founder Terreform ONE



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ALEXIA LIDAS