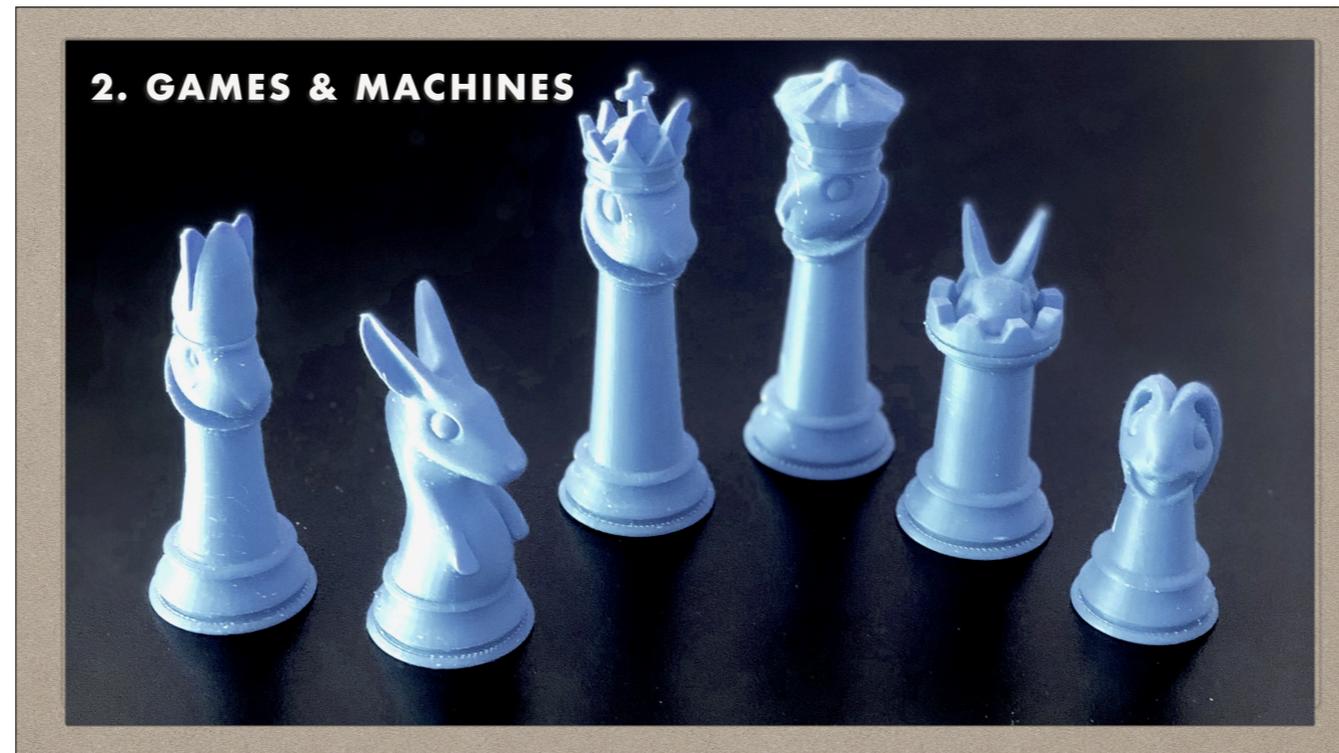


AND MY POINTS ARE:

1. Thinking into other boxes
2. Games, machines & you
3. It takes AI to do AI
4. Eureka! vs. Hmmm, that's funny...
5. Curiosity as a design skill
6. Who's not here? (Where's here?)
7. An apologetics of Design



1. Not a traditional keynote. I want to offer some outside ideas to connect with your ideas. Consider these like construction materials for the minds of those in AEC industries.
2. Clearly, I am not an architect, but I frequently speak to AIA groups because I have a good sense of your world and concerns and then put those into an outside perspective.



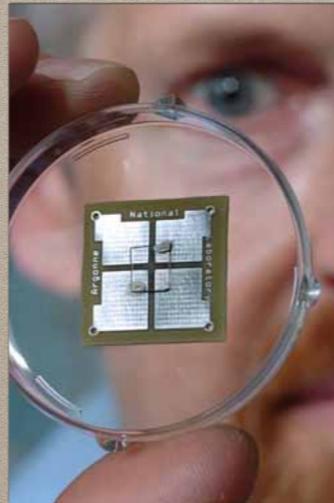
1. 1997 Big Blue beat Kasparov. Revolution: computers: smarter than us, sort of... yet, they're still **toddlers**
2. Centaur program: Computers beat humans in chess, unless w/ computer
 - a. Computers: massive memory & calculation + Humans: intuition, creativity, empathy
 - b. Measurable + immeasurable. Uniquely human skills: learn, express and defend!
 - c. **Think for skills, not jobs:** let AI & big data sort into tasks.
3. My friend Bruce Branit: his 5 year old liked chess AND bunnies. So they designed and 3D printed.
 - a. BB: Arch school drop out - never got a degree.
 - b. They didn't offer degrees for what he now does - VFX. WestWorld.
 - c. **Teach for skills, not jobs:** let AI & Big Data help sort and organize individual talents.
4. Book: Annie Duke, Thinking in Bets: **Life ≠ Chess: machine. Life = Poker:** Skill, luck and bets based on incomplete information. Valuable information remains hidden, for now. Real life doesn't easily reveal objective truth. You need curiosity and communications skills to learn about the world.

IoT IPV6: 340,282,366,920,938,463,374,607,431,768,211,456



1. IoT IPV6: Everything wants to talk, just not so much with you.
 - a. Is this like Poker? Chess? How do you reduce unknowns \neq extreme vagueness?
 - b. How to design info access/presentation: connection/comprehension?
 - c. Info wants to be free? Maybe. Are you afraid to share?
 - a. Data wants to connect. Data don't care what you think.
2. Todd Wynne from Bluebeam: fascinating presentation on all the tech changing the way we build and interact with built environment. Drones using GCPs (Ground Control Points) and creating digital twins of your projects.
4. If you ever think, that's not going to happen, ask: What else would have to happen so that this really could happen?
5. BIG Q: If there's an app for that, is there an app for you...
6. Can Architects be automated? No. (Not the good ones.) How to define good: 2019, 2024?
7. Can Presenters be automated? (Soon, but not yet.) IBM Big Blue beat Kasparov in 1997, 2011, Watson beat Ken Jennings on Jeopardy, in 2019, IBM Debater GOT BEATEN by Harish Natarajan.

What comes after what comes next?



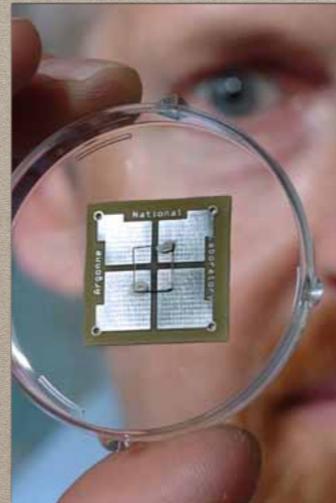
Futurist? What comes after what comes next? And what else: Implications X 3

1. Briefly: 3D Additive Manufacturing: a. Reimagining: manufacture just about anything. b. Localized manufacturing renaissance? Point of consumption.
2. Emerates247 : Experts estimate that 3D printing technology can reduce the production time of buildings by 50 to 70 percent, reduce labour costs by 50 to 80 percent, and can save between 30 and 60 percent of construction waste.
3. What % of construction or materials: 3D printed by 2024? (Five years: will you still be working? Then you have to be asking these questions.)

What comes after if this is next: Talk about nanotechnology.

4. Mike Zach & Marten Machining: patent: a mile long nanowire. Why?
5. Werner von Braun: Basic research is what I'm doing when I don't know what I am doing.
6. Mike Z: 4X dropout, artist before scientist. "Couldn't be good scientist..."
7. Phil Bernstein: "Things happen really slow..." For whom?

What comes after what comes next?



Dr. Mike Zach:

They throw billions of dollars using brute force to make things nano. We do it by watching nature self-assemble structures and learn to coax individual atoms and ions.

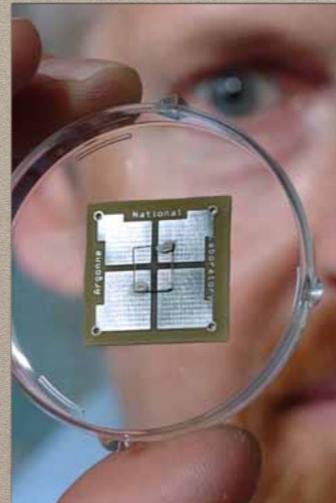
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Nature doesn't have multi-million dollar fabrication facilities, yet it beats our engineers by 5 orders of magnitude in size and an infinite order of magnitude in cost for self-assembly in biology and materials science.

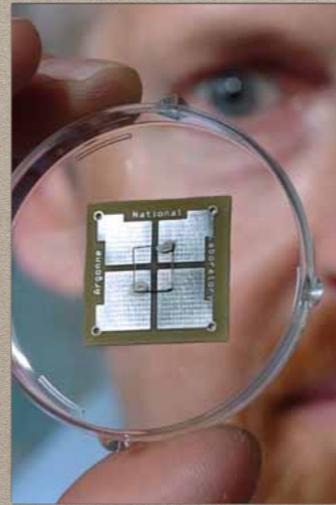
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To make nano cheaply, we only need to find conditions that nature wants to make things. Every biological cell is proof of that.

Combine structural patterning elegance in biology with the material deposition finesse found in geological mineralization processes and we have most everything we need for a million times less energy.

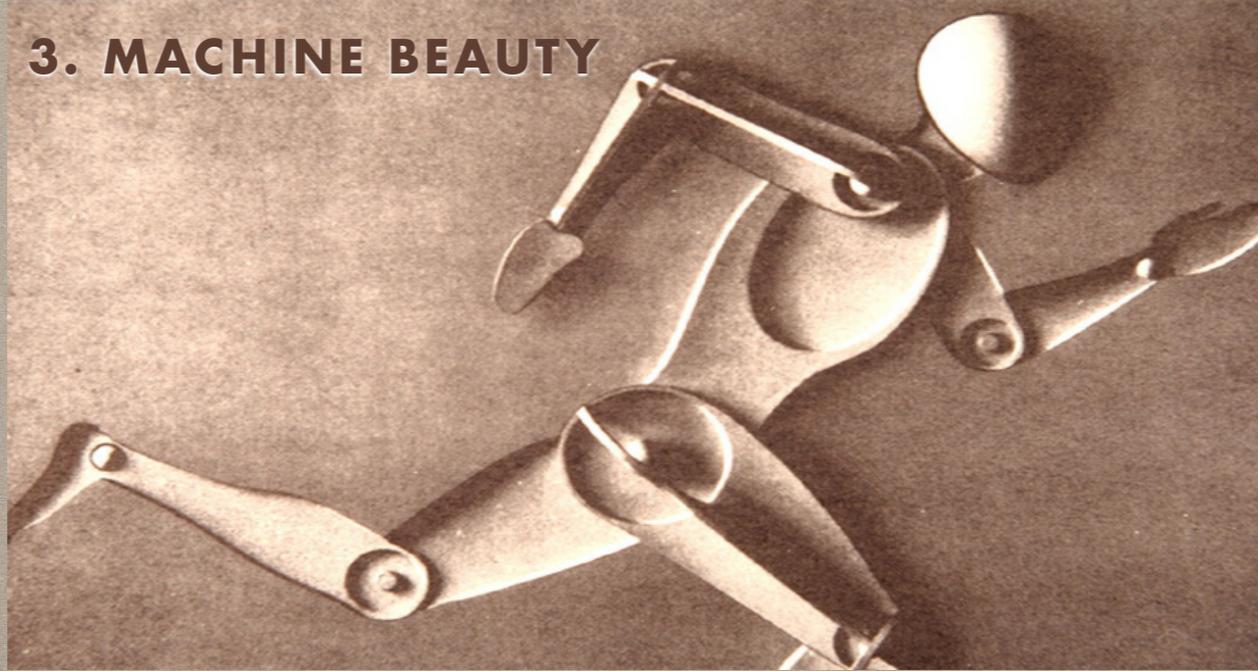
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3. MACHINE BEAUTY



1. Read: Kevin Kelly: The Inevitable: It's not AI, it's AA (No, not that AA: Alien Intelligence!)

2. If you can measure it, you can manage it. IOW: you can automate it.

3. Mitch Ratliffe, "Mistakes will be made..."

Milton Friedman: The power to do good is also the power to do harm.

4. Nicholas Carr: "Humans risk being seduced by automated programs because they carry out work in a "black box." Questions in; answers out.

Are going for a quicker, faster, cheaper bottom line? Go for a farther horizon.

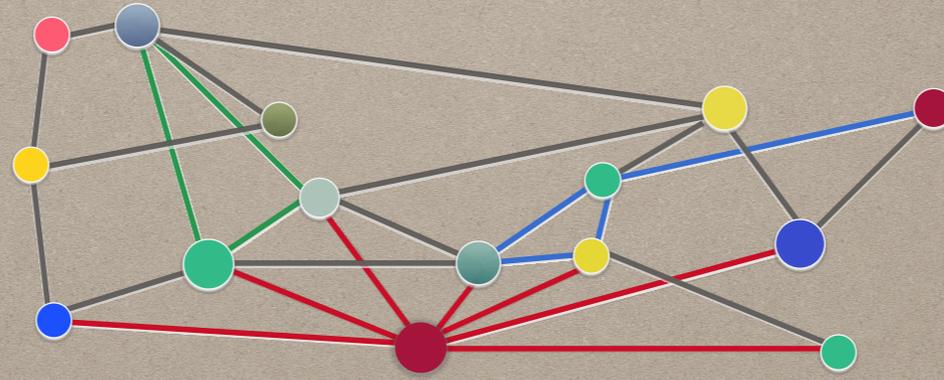
Data and memory are machine's strengths. What are yours?

5. Book: David Gelernter: Machine Beauty: Power married to simplicity equals machine beauty. More important in computing than in anywhere else in technology because software is always in danger of drowning in complexity. Hardware is held in check by physical reality.

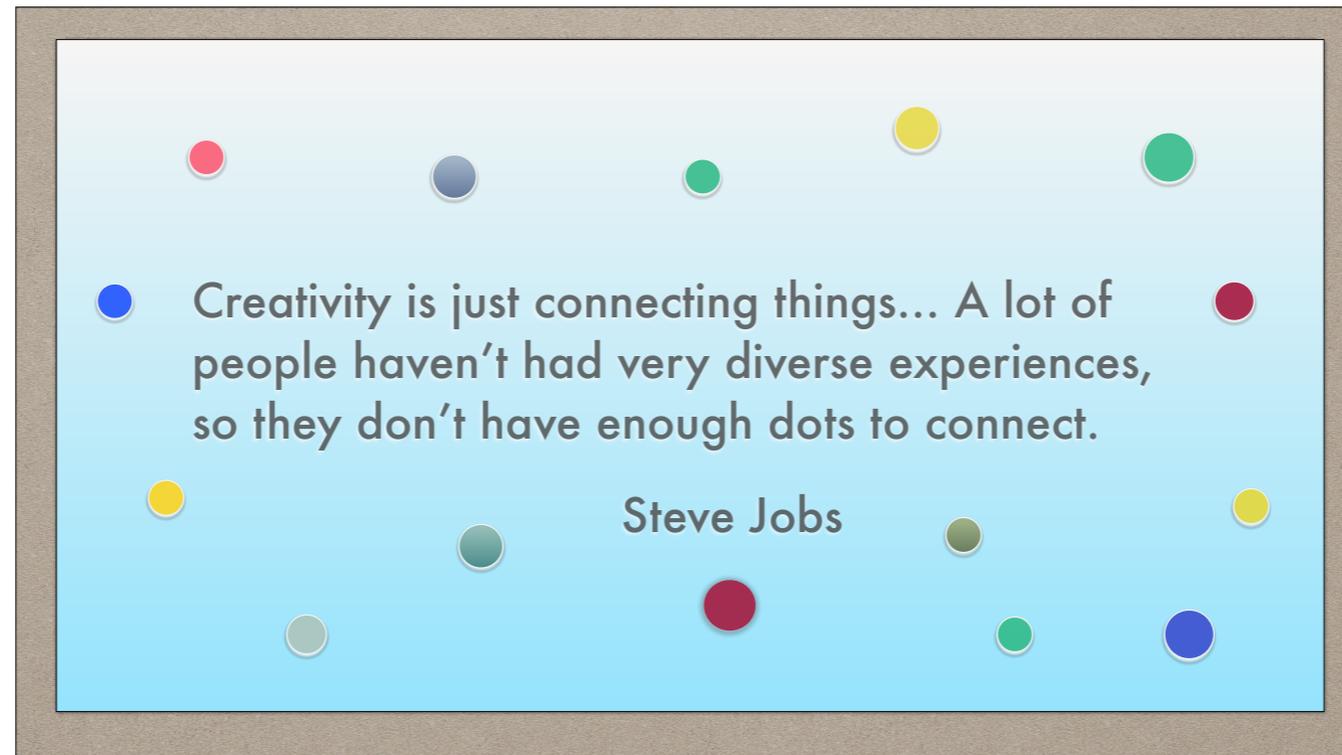
6. Complexity threatens our understanding and our abilities.

4. THINKING INTO OTHER DOTS

"The Adjacent Possible" Vittorio Loreto, et al.



1. Some of this comes from Stuart Kauffman Complexity theorist
2. Adjacent possibles: possibilities: easily imagined and expected, unexpected, hard to imagine.
3. Novelties: New to you. Innovations: New to the world.
 - a. Each innovation changes the landscape of future possibilities.
4. Book: Peter Theil: Zero to One: Innovation is not always neat and clean: 4 of 6 PayPal: Hold my Beer!
5. Where's your competition? Automation, Nanotech, 3D Print, VR,
 - a. Phones! #idonnotlookup
6. How many of you are thinking about your exit strategy?
7. Wealth comes from connecting things. Not yet connected? Who will do the connecting?



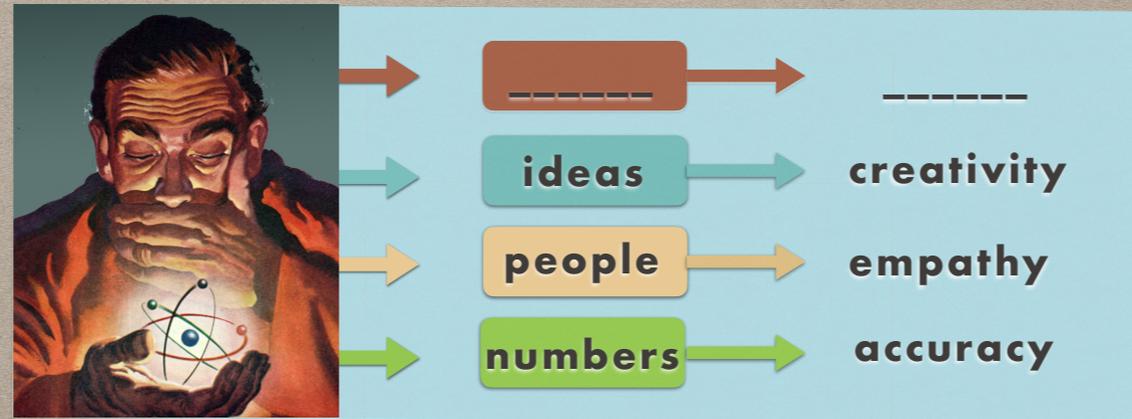
1. Again: what's not yet connected? Believing is seeing? Who's counting those dots? How many dots are there? (Really...)
2. How would you accurately define diverse experiences for creativity?
3. Jobs is only partially right.
 - a. Diverse experiences, epistemic experiences are when you drill down for competence.
 - b. Most creatives have to develop competence upon the diverse experiences.
4. Eden Phillpotts: The universe is full of magical things, patiently waiting for our wits to grow sharper.

5. CURIOSITY SKILLS THE CAT



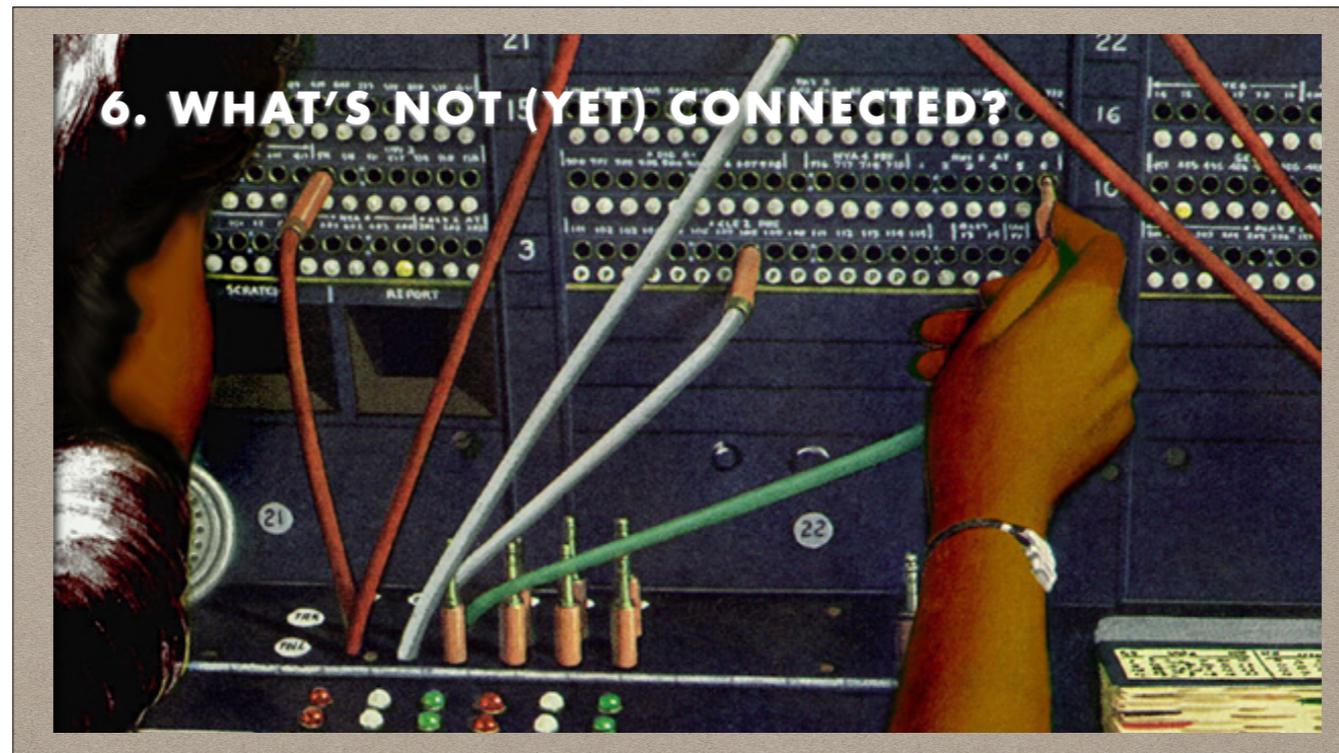
1. Book: Curious by Ian Leslie
 - a. Curiosity creates a web for things to connect to when encountered.
 - b. Kids between 3 & 5: 40,000 questions. Even pointing is a question. They're trying to get a "map."
 - c. Kids quickly figure out if you're an idiot or not based on how (or if) you answer their questions.
 - d. Diverse, then epistemic. Competence that's connected with lots of dots? Adjacent possible: novelty & innovation.
2. What happens to curious co-workers? (Annoying?) Learn how to curate your curiosity as an adult.
3. The miracle of compound interests.
4. Chris Morrison, FAIA: The architectural world is not based on concrete and steel; it's based on curiosity.

What else needs an architect's curiosity?



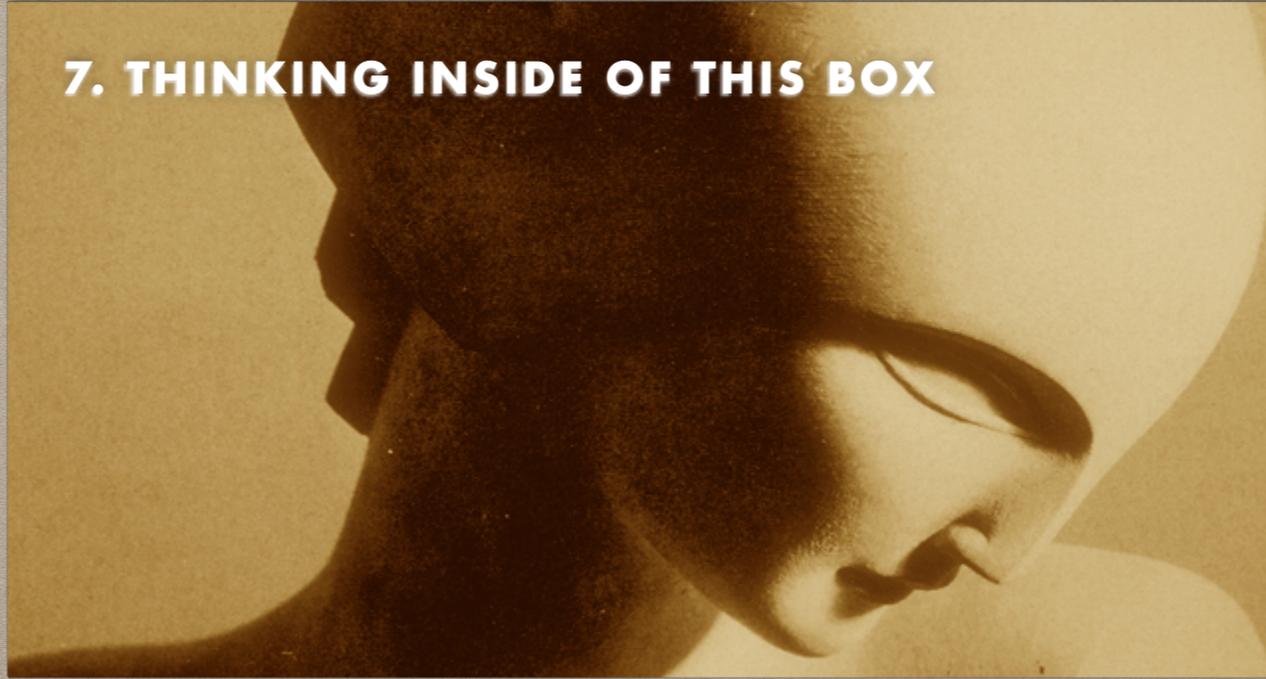
Partial source: www.jarche.com

1. What else needs your curiosity?
 - a. Is drawing part of a curious mind? Allow for your ideas to be connected/manifested.
 - b. Finnish architect book: Juhani Pallasmaa, *The Thinking Hand*: "The use of the computer has broken the sensual and tactile connection between imagination and the object of design."
 - c. We've been reducing design input down to a single fingertip...
2. Who has a better sense of what you need to be curious about - than you?
3. @MelissaPierce tweet: So many buildings look cold and unromantic, boxy without curves. Am starting to believe the architects had mothers who never loved them.
4. Cameron Sinclair at 2013 AIA convention: The most sustainable building is a building that is loved.



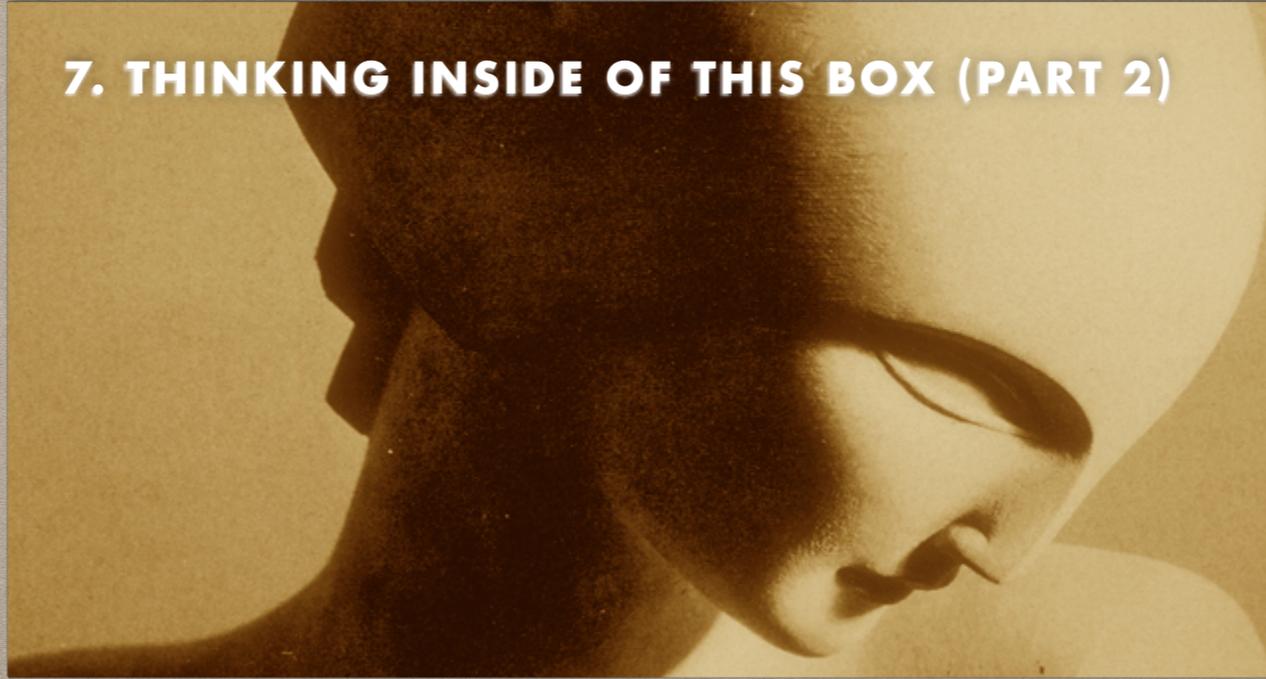
1. Who's not here?
2. Go out for lunch more: "When we break bread, we break barriers."
3. Presentation skills: If you can't explain and defend your design, you don't really have a design.
 - a. David Fannon, Building for the future takes a certain humility...
4. Book, Albert Hirschman: Exit, Voice & Loyalty: Take a look at SEG D organization: very successfully growing organization: brings together anyone who is connected to how we experience the built environment.
5. Too often lacking skill: Empathy: Very difficult with exclusive/exclusionary occupations.
6. Culture, how do you get it? From nice, orderly, clean process, or you can get it from messy life: Where does milk come from? (A nice clean store or a dirty cow?)
7. Jonathan Haidt: Listen as if you were wrong, and wanted to know why.
8. Philosopher Martin Buber: I and Thou, rather than I and it.

7. THINKING INSIDE OF THIS BOX



1. Asked: Who's not here? Also need to ask: What's not here?
2. Vitruvius: Firmitatis, Utilitatis, Venustatis: Only two of these are **measurable**. The other is **immeasurable**.
 - a. When the only tool you have is a hammer... only tool a computer: data... your brain, **your mind**
 - b. If measurable: there's an app or augmentation
 - c. If not measurable: it belongs up here in your head - and between you and me: between "I and Thou."
3. Billie Faircloth, FAIA: Why do we design the way we do? TEDX Philly talk: 2x4: molecular structure.
 - a. When we rethink things, they can become emerging materials. Can we become emerging industries?
 - b. Phil Bernstein said: Boomers were trained by insurance company. (Risk adverse, not as creative.)
 - c. Bet on Generative: err on the side of life: adventure > still have a heart of amateur (ama: love)

7. THINKING INSIDE OF THIS BOX (PART 2)



4. STEM to STEAM: If you teach these, you have to also learn PPPTHB: Prose, Poetry, Philosophy, Theology, History, Biography: An apologetics of design. Again, if you can't explain/defend your design, you're not really a designer. You have to better understanding the full implications of what it is that you do.

5. David Gelertner, Machine Beauty:

a. "The best computer scientists are technologists who crave beauty."

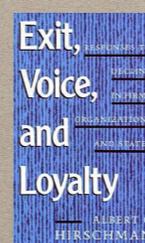
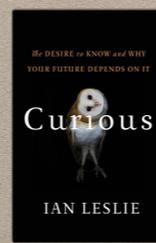
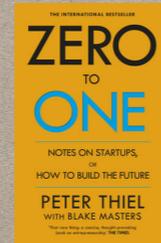
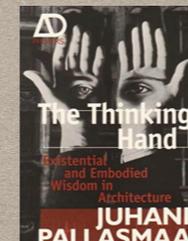
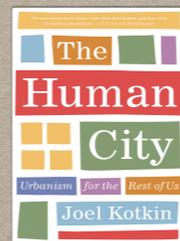
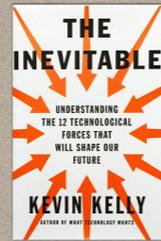
b. "Beauty is the ultimate defense against complexity."

6. Alain de Botton, The Architecture of Happiness:

"The creation of beauty, once viewed as the central task of the architect, has quietly evaporated from serious professional discussion and retreated to a confused private imperative."

7. We have become obsessed with the self: pocket mirrors pretending to be smart phones.

8. We don't need more HSW, we need more poetry. We need architects to be more poetic. They need to be eloquent. They need to help make the built environment more elegant.



Reading List from David Zach

2019 AIA PDKC

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