



"We think of architecture as an additive process: Contractors typically assemble construction elements one by one. But architecture can also be thought of as subtractive, where portions of a volume are removed to reveal their essence, like a Michelangelo sculpture."

Eric Fisher AIA, LEED AP

This talk will focus on demonstrations throughout history of how architects have designed using subtractive processes. These strategies may be literal - where a building is carved from existing materials - formal - where light construction is designed to look massive - or conceptual - where the absence of form becomes figuratively present. Variations of these strategies remain powerful today. Mr. Fisher will augment the discussion with examples from his own portfolio.

Tuesday June 21, 2016
6:00 p.m. — 7:30 p.m.

Landmarks Preservation Resource Center
744 Rebecca Avenue, Wilkinsburg, PA 15221

This lecture is free to PHLF Members. Please join!
Non-members: \$5



About the presenter: Eric Fisher AIA, LEED AP, is the principal at Fisher ARCHitecture, a Pittsburgh firm he founded in 2006. A fourth generation Pittsburgher, Eric has more than 25 years of experience as an architect, working in Europe and the United States, including a four year apprenticeship with Richard Meier, detailing the Los Angeles Getty Museum. He holds engineering and visual arts degrees from Dartmouth College along with an architecture degree from Harvard University.

NAKED ARCHITECTURE

Addition through Subtraction...



PITTSBURGH HISTORY &
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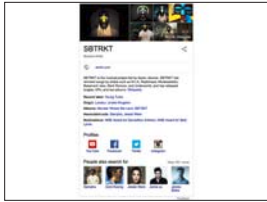
Fisher ARCHitecture
www.fisherarch.com

Naked Architecture: Addition through Subtraction

Thanks to Karamagi Rujumba, Loise Sturgess, and to the folks at my Fisher ARCHitecture studio, without whom this talk would not have been possible. Just this morning in our weekly studio presentation, we were all inspired by Jiayu Qin, who presented her elegant, minimal bookbinding projects to the group.



Preface



You've been listening to music from the British electronic music band, SBTRKT. The artist, Aaron Jerome, who wears tribal masks as he performs to hide his identity, has suggested that the project name represents his goal to subtract his ego from the music creation process. The title remains legible even though he has deliberately misspelled it and subtracted all the vowels.

Today I will be talking about the way subtraction affects architectural FORM. If you've read the lecture description, paid your five dollars, and are sitting here, you don't have to be familiar with my work to know what you are going to get. So I need make no apologies in advance. That being said, many people believe that architects are overconcerned with form, which keeps them from thinking about more important concerns like program, function, and location.¹

I believe that's total nonsense. It's like saying doctors shouldn't be concerned with ethics, or window installers with glass. Architects control the way the built environment looks. Certainly they need to think about it. My opinion is that buildings should respond intimately to the complete history of their surroundings which includes both physical and cultural elements. As the critic Alberto Perez-Gomez has written, "*History is our full inheritance...Because (it contains) authentic knowledge...it demands that we take a position.*"²



This will not be an "*I designed this, I designed that*" sort of talk, although I will use a couple of my buildings as examples. Instead you are going to hear some thoughts that have been on my mind lately as I have been designing. These are the edits of my lecture description. I subtracted seventeen words from the original text without affecting its meaning at all.

Architects can not resist the urge to peel away unnecessary clutter because that is the way we design our projects. Even Frank Lloyd Wright didn't always get it right the first time. The concepts expressed in our drawings start out unresolved but are clarified and simplified over time. The urge to subtract drives our process. Because, inevitably we all become what we do, architects apply the principals we learn to every aspect of our

1 "Intellectual [dis]Honesty in Architecture" New England Review, Kenneth G. Masden II and Nikos A. Salingaros, 2013

2 "The Modern City: Context, Site or Place for Architecture?" p. 78

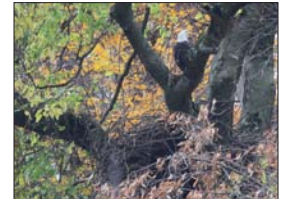
lives. My education in design has even changed the way I write.

Introduction

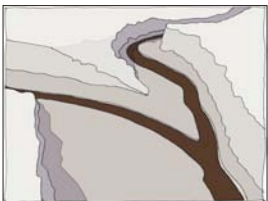


We think of architecture as accumulative. First you build your house. Then you build an addition. After you lay a brick, you lay another. I conceptualized my design for the Emerald Art Glass House as an assemblage of building systems constructed one after another to form a whole. It's natural to think of architecture that way. But that's not the only way to look at it.

Subtraction is a powerful concept, so powerful that even animals understand it. All female mammals and most birds will notice the number of young that they have.³ According to one study, if the nests of certain birds contain four eggs and a predator steals one, then the mother will stay with her remaining eggs. But when two are removed the bird generally deserts. The bird can distinguish two from three.⁴ Wasps have the same skill.

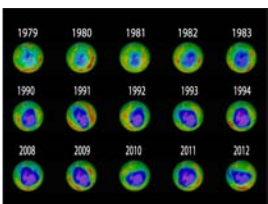


Our earliest ancestors must have pondered the concept of subtraction as they noticed the earth around them eroding and weathering. Even today - especially today! - our planet has much to tell us. For example, we think of the land on which downtown Pittsburgh sits as a base from which the surrounding hills have sprung, like shrubs growing in a yard. After all it's at the center, so we think of it as a source, much as people used to believe the sun revolved around the earth.



The truth is quite different: In reality the entire Western PA region was at one time a flat plane at an elevation of about 1300ft above sea level. Spring Hill, Troy Hill, The Hill District, and the South Side Slopes all have areas that approach that height today. Over several million years the rivers have carved away the land so that our hilltop neighborhoods now sit 600ft above the confluence.

Our hills surround the city, containing its inhabitants and make us feel secure and comfortable. This is one of our city's strongest physical characteristics and we owe it to the subtraction process.



Subtraction: History

Not all earthly subtraction derives from natural processes. At this very moment, subtraction from the ozone layer is causing increased levels of sunburn, skin cancer, and cataracts, as well as damage to plants and reduction of plankton populations around the world.⁵

3 "The Number Sense" <http://www.math.wichita.edu/history/topics/num-sys.html>

4 "Number: The Language of Science" Dantzig, Tobias. New York: Macmillan Company, 1930.

5 "Ozone depletion" https://en.wikipedia.org/wiki/Ozone_depletion



One of my favorite books as a kid was “The Hole Book”, written in 1908 by Peter Newell. Each page contained a literal hole formed by a literary bullet that bored its way through the book. Similar to the way the hole in our ozone layer is changing our planet, the subtraction of a part of the page disrupted the status quo, playing havoc with the lives of the characters.⁶

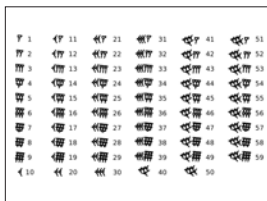
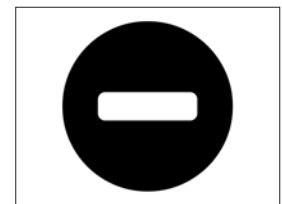
Children can intuit subtraction as infants because we are born with mathematical abilities.⁷ And we process subtraction different from the way we process other calculations. As Mathew May wrote in the New York Times,

In reading several articles in scientific literature, I discovered that subtraction lights up a brain scan differently than addition does, because it uses different circuitry. In fact, accident victims suffering brain injuries often lose their ability to both add and subtract, retaining only one of the two. Subtraction is literally a different way of thinking.⁸



When your favorite blanket is in the dryer, when a favorite action figure loses an arm, when a pet dies, or when a parent is ill, we perceive that things can go away and that what we are left with is less than what we had before. “But a child’s ability to perceive numerical differences in the people or objects around him or her is very limited when the number goes beyond three or four.”⁹

We don’t truly come to understand the concept analytically until grade school, when we learn to calculate and to use the minus sign. This is the first time we associate text with something other than language and the alphabet. The minus sign makes subtraction official. By quantifying loss, it codifies it. As we grow we grasp that the minus sign can be attached not only to numbers but also to letters: “B-”, for example, means B-type blood with the Rh factor absent.¹⁰ An “A-” is less than an “A”. A “C-”, God forbid, is less than a “C”. And the word, minus, can be used on its own to signal that something is lacking: It would be a definite “minus” for me if you did not find this talk entertaining!



Why is the concept depicted with a single line? The first known example of subtraction is from ancient Babylon. Even at that time it was represented as a line floating over the thing that would be subtracted.¹¹ It may have been that the symbol represents the gesture of a hand cutting the air horizontally, which resembles the

6 In film, the bullet would be a great example of a “MacGuffin”, <https://en.wikipedia.org/wiki/MacGuffin>
 7 “Addition and subtraction by human infants” <http://www.nature.com/nature/journal/v358/n6389/abs/358749a0.html>
 8 “The Art of Adding by Taking Away” Mathew May The New York Times Jan. 19, 2013
 9 “From One to Zero: A Universal History of Numbers” Ifrah, Georges. New York: Viking Penguin, Inc., 1985.
 10 “Plus and Minus signs” https://en.wikipedia.org/wiki/Plus_and_minus_signs
 11 “Babylonian mathematics” http://www.math.tamu.edu/~dallen/masters/egypt_babylon/babylon.pdf

act of erasing a chalk tablet, subtracting from its meaning.¹² The astrophysicist, Mario Livio, disagrees. His thought is that the plus sign came first, as a 14th century Latin representation of the word, “and”, as a cross.¹³ If he is right, it stands to reason then that the minus sign is a simplified plus sign, a plus sign with the vertical line subtracted.



Subtraction: Teaching

There are different ways to teach children how to subtract. A couple of them that teachers use are “takeaway”, “difference”, and “counting back from”¹⁴ As you would expect, methods have changed over time. Controversies have arisen over the perceived advantage of the “decomposition method” versus the “equal addition method”

or the “Austrian algorithm” method.¹⁵ You can imagine short bearded early twentieth century educators throwing chalk at each other’s black suits as they argued over these techniques.



Subtraction: Meaning

Wherever subtraction began and however it is taught, the concept is associated with disruption, degradation, and diminishment: I worry if my twenty-pound kitty loses weight. Zombies are decayed humans. Potholes appear in diminished streets. Overly reductive political ideas discourage deep thinking about complicated issues.

Yet subtraction is also associated with improvement: Subtraction reveals essence: When you subtract the leaves from an artichoke you reveal its heart. When a river courses through a plane for six million years, the resulting canyon reveals fossils and minerals. When you subtract the clouds from the sky, the sun shines. In each of these circumstances, subtraction clarifies an entity, laying bare a more natural pre-existing condition.

This is what Aristotle was getting at when he compared what he considered to be the essential qualities of an object to its accidental properties. A property is thought to be essential if an object can not do without it. You can subtract the arms from a chair and it is still a chair, but if you can’t sit in it, then it is a chair no longer. Avoiding the subtraction of essence is the sculptor’s biggest challenge.¹⁶



It is the act of honing, of whittling away, that makes subtraction different from transformation, when one thing is simply changed into another. When caterpillars emerges from their pupal stage, certainly they have shed their shells and their former shapes, but their new identities are not less than they was before. To the contrary.

12 In scuba diving, this hand motion is a signal that something is wrong. It could be that the sign indicates a lack of safety - the subtraction of balance from a situation. “Common Hand Signals for Recreational Scuba Diving” www.neadc.org/CommonHandSignalsforScubaDiving.pdf

13 “The Origin of the Plus and Minus Symbols” <http://www.tested.com/science/math/454129-history-plus-and-minus-symbols/>
14 “Motion Math Blog” <http://motionmathgames.com/how-to-help-your-child-learn-subtraction-part-1/>

15 “Subtraction in the United States: An Historical Perspective” Susan Ross & Mary Pratt, Cotter <http://math.coe.uga.edu/TME>

16 “Stone Project” Edinburgh School of Art, <http://www.stoneproject.org/reductive-subtractive-thinking.html>

Sometimes subtraction occurs as one action among many. Yoghurt is decayed milk sugar. Wine is grapes with the sugar subtracted out by yeast, mold, and bacteria. Although subtraction is surely occurring, other actions are happening as well, and the resulting entity is not so much simplified as it is converted.

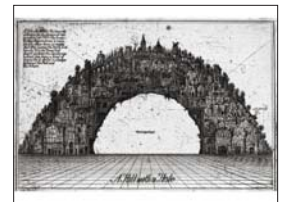


Meaning inevitably reflects human nature and society. A concept with so many implications inevitably acquires many connotations. As human beings have traded goods for more than 150,000 years, it is no surprise that subtraction is associated with ownership.

Question: If you have three donuts and Joe eats one, then how many do you have left? Answer: Well I'd still have three if not for Joe... A quick search of the Internet reveals that worksheets for practicing subtraction are filled with problems dealing with money. Like Joe's apple, even subtracted space has value.

*"He who owns a hole, even exclusive of its material envelope, is a man to reckon with if you must reach the far side of the hole, and cannot feasibly tunnel beneath it, fly above it, or make your way around it."*¹⁷

Subtraction is personal: We all often think about cutting out activities that provide neither personal nor professional benefits: How often have we all thought about getting rid of needless clutter in our homes? How often have we vowed to subtract the ten pounds that separates our bodies from their intended shape? I'd like to subtract half the television shows I find so interesting and I'd be fine with subtracting, say, ten years from my age.



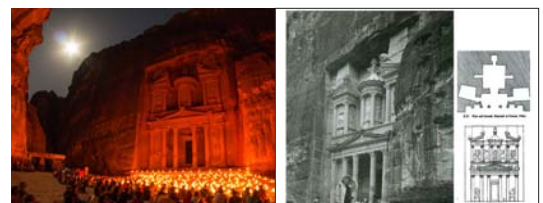
Subtraction is impersonal. When our sun goes super-nova, our planet will one day be subtracted from the set of existing planets in the universe.

Literal Subtraction in Architecture



The simplest way architecture can be subtractive is when the space of a building is literally carved from solid material. 35,000 years ago our Paleolithic ancestors lived in caves because they required a dry refuge from outside danger. They worked on the caves, drawing on the walls, raising the ceilings, and extending them in depth.

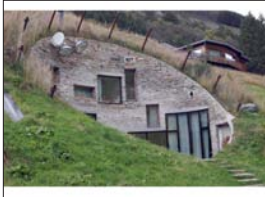
33,000 years later in Petra, the Nabataean residents carved spaces around their local caves and fashioned them with temple-fronts. The Nabataeans felt the caves were the most appropriate place to worship and to bury their dead because their theology had especially strong links



to the earth.¹⁸



Today, people still inhabit caves, but mostly for romantic reasons. I find the Santorini cave pools so attractive because although they are exceedingly primitive, they are also clean and safe. The walls are pure white, the water cleansed with chlorine. There, guests can live for a while like a “hero” from the ancient past, only with health care and credit cards. We’ve come a long way from Chauvet!



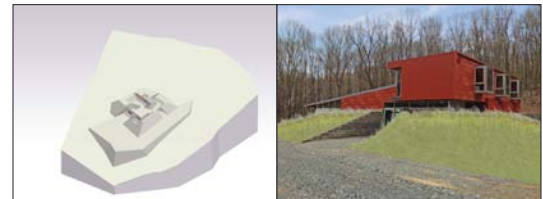
Underground homes were hip in the 60’s and so they are again today. Some are literally subtracted from the earth. Others are constructed to make it look as though they are. These homes stay cool in the summer and warm in the winter. Also, they are very private and are well protected against natural disasters like hurricanes or tornadoes.

The 2009 Villa Vals in Switzerland, designed by Bjarne Mastenbroek and Christian Müller, was completely integrated into the surrounding hillside to avoid disturbing the natural landscape.



To this day the artist Ra Paulette - whose work I first ran across two years ago at Pittsburgh Filmmakers when I viewed a documentary on his work - carves his self-made caves from the sandstone cliffs of Northern New Mexico.

My own design for the Ewing House in Sarver, PA was carved out of soil collected from the building’s steeply sloped woodland site.



Cities

Soil and rock are not the only materials that architects subtract. Subtraction can also happen at an urban level. Buildings and even entire neighborhoods are often slated for destruction as cities grow. In Paris, George Haussman removed

large portions of the medieval city in response to Emperor Napoleon III’s directive to bring air and light to the center of the city.¹⁹

In New York City, Seneca Village was entirely demolished to make way for Frederick Olmstead’s ambitious plans for a central park. Even as we are sitting here neighborhoods are being destroyed throughout China in Beijing, Baotou, and Zhengdong, among many others. According to research firm, GK Dragonomics, China

18 <https://www.calvin.edu/petra/about/nabataeans.php>

19 “Haussmann’s renovation of Paris” https://en.wikipedia.org/wiki/Haussmann's_renovation_of_Paris



demolished 16 percent of its housing stock between 2005 and 2010!²⁰

It is true that sometimes parts of the city can become toxic. Like clothing, neighborhoods can simply wear out and need to be replaced.

In the middle of the nineteenth century, the center of Paris was overcrowded, dark, dangerous, and unhealthy. In 1845 the French social reformer Victor Considerant wrote: "Paris is an immense workshop of putrefaction, where misery, pestilence and sickness work in concert, where sunlight and air rarely penetrate. Paris is a terrible place where plants shrivel and perish, and where, of seven small infants, four die during the course of the year."²¹



But often subtraction can go awry. Our own city provides a great example. As we have oft-heard, entire Pittsburgh neighborhoods have been subtracted from the fabric of the city over the last century. The Lower Hill District, Allegheny Center, and East Liberty all at one time possessed a coherent, if aged, urban character even if the inhabitants may not have been wealthy. Although each of these neighborhoods exhibited a strong sense of community,²² each was in turn characterized as blighted and partially demolished in the name of progress.



These were optimistic times: Variations of this sort of top-down, "big picture" schemes were being implemented around the world at this time with varying degrees of success. In India, there was Chandigarh; in East Berlin, Karl-Marx-Allee; in Brazil, Brasilia. Yet the designers who imagined these utopias inevitably did not fully account for the way people actually live their lives, which is inevitably different from the way the designers would have them behave...

Critics of Brasilia's grand scale have characterized it as a modernist platonic fantasy about the future: Nothing dates faster than people's fantasies about the future. This is what you get when perfectly decent, intelligent, and talented men start thinking in terms of space rather than place; and single rather than multiple meanings. It's what you get when you design for political aspirations rather than real human needs. You get miles of jerry-built platonic nowhere infested with Volkswagens. This, one may fervently hope, is the last experiment of its kind. The utopian buck stops here.²³

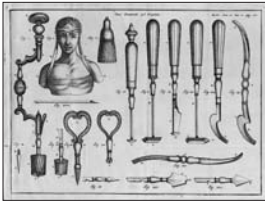
In Pittsburgh, the result came to resemble the effects of nineteenth century pseudoscientific surgery techniques that involved subtracting a portion of the skull to

20 <http://www.citymetric.com/skylines/during-its-long-boom-chinese-cities-demolished-area-size-mauritius-every-year-1414>

21 "Le Paris d'Hausmann" Patrice Moncan p. 10.

22 "Root Shock" Mindy Fullilove, One World/Ballantine 2005

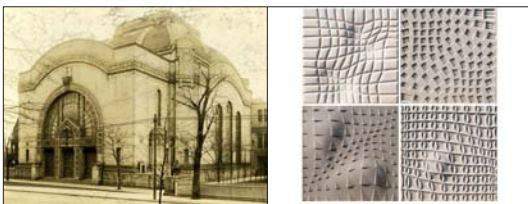
23 "The Shock of the New", Episode 4: "Trouble in Utopia", Robert Hughes 1980)



“cure” madness, depression, and epilepsy.²⁴ More than 8,000 residents, most of them African-American, were forced to move from the Lower Hill District as the bulldozers moved in. The demolition not only removed the neighborhood’s most important social and cultural institutions, it also severed the neighborhood’s connection with its neighbors. For more info on this, please read Dr. Mindy Fullilove’s excellent book, “Root Shock”, on the subject. This is the legacy the Bjarke Ingels team is facing as they move forward with their proposed scheme for the site today.

Details

There are other sorts of literal subtraction. Architectural details can also be subtractive. For example, the Athenian sculptor, Callimachus, created the first Greek Corinthian column. While the acanthus leaves growing from a basket that he used as a source for his capital (column top) may have been additive, growing from a seed to their final form, the resulting stone column was certainly subtractive, as it was carved from a larger block.



In 1907 here in Pittsburgh, the architect, Henry Hornbostel designed particularly impressive subtractive stone shapes for the Rodef Shalom temple right down the street. Today, laser-cutters and CNC machines have made subtraction easy. Complex shapes are possible that no human hand

could possibly have created.

Buildings

Building renovations often feature the subtraction of superfluous layers to reveal their original shape. And some times, architects demolish buildings selectively, saving portions of the structure that are still useful and doing away with others. Other times the subtraction process can be more radical, as in the work of the Conceptual artist, Gordon Matta Clark, who sliced into abandoned buildings in an attempt to critique gentrification.



Just this year the architects, Yitan San and Jianshi Wu, proposed a scheme that would excavate Central Park down to bedrock. They are proposing the creation of more than seven miles of new floors, eighty times that of the Empire State Building that would wrap around the park in an effort to make the green space visible to more people.²⁵

I confess to really liking this proposal. If it were even remotely affordable and I were

24 “Textbook of Epilepsy Surgery” Trepanation: definition, Hans O. Luders, Informa UK Ltd 2008 (P.8)

25 “Yitan Sun and Jianshi Wu” <http://www.designboom.com/architecture/central-park-1000-foot-glass-walls-new-york-horizon-yitan-sun-jianshi-wu-evolo-skyscraper-competition-03-25-2016/>

king of New York, I would likely say, “Go for it!” Yet is demolishing Central Park and then rebuilding it an appropriate act? The Italians have made a science out of renovation, with precise rules defining what is and is not appropriate. There, selective demolition is a ‘sin’ (and against the law), unless conservation presents a risk to public health. After all, goes the argument, who are architects to decide whether pieces of a building are obsolete?

Said a thoughtful Italian friend to me in response to one of my more aggressive design proposals, *“We know that conservation is all about preserving the past in order to deliver it to future generations. Don’t tell me that you are just demolishing crappy stuff, because that is the Donald Trump approach to architecture. I am sure you can do better!”*



I get that point of view. The activist, Jane Jacobs, author of the influential 1961 book, “The Death and Life of American Cities” may have agreed. But is it better to put buildings on a pedestal simply because they exist? When you preserve a building, you are inevitably forming a judgment that the building is worth the time, energy, and expense to restore. Would you renovate a Pittsburgh suburban tract house built in the 1960’s? How about the seventeen story, low income, East Liberty “East Mall” building that once straddled Penn Avenue?

As a general rule, my personal point of view is to let new be new: Copying the look of old buildings does those old buildings no favors, because modern construction techniques do not lend themselves to the kind of details old buildings feature. Besides, it’s not sincere. We live in the present and I feel our new buildings should reflect that truth. Our needs and aspirations reflect our times.

And let old be old: We should certainly restore worthy old buildings because our shared history is worth preserving. It is what binds our culture together. And these buildings are often beautiful, with spatial configurations and decorations that cannot easily be duplicated today.

However, there are times when demolishing a building selectively is less evil than doing nothing. Sometimes complete renovations may match neither the client’s budget nor his program. And well-intended projects that clients don’t like are frequently cancelled. Arrogant though it may be, architects are trained to judge whether or not buildings are worthy.

If an architect can save part of a building that would otherwise fall into ruin or be entirely demolished and then repurpose the remaining parts so they respond to current needs, then I’m all right with that. And the resulting experiences can be powerful.



We took great pains to save the block base of an old distillery as we designed our River House

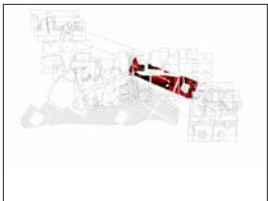
project here in the office. Yes we removed the brick top, but the new steel frame we created in its place was able to support automobile traffic. As a result the owners are now able to cross a bridge to access their home and park on the third floor.

Formal Subtraction



But here is where subtraction in architecture starts to get really interesting: Subtraction does not always have to be literal. Sometimes architects play an interesting game and create structures that look as they have been subtracted from even though they have been constructed all at once.

In order to make it clear how this can be accomplished, let's introduce the idea of "implied time" in design. If you lay in the sun with a book on your chest you will likely tan. And if you remove the book, as this photograph by the conceptual artist, Dennis Oppenheim shows, you will be able to infer that it was once there.



If you attended my lecture here last year, you may remember that I introduced the concept of a palimpsest (from the Greek, *palimpsestos*, meaning scraped again). A palimpsest is a written document on which partially subtracted previous texts are still visible. One fascinating element of a palimpsest is that it contains a record of its own history. The photo of the tanned man with the book removed is a palimpsest of sorts. So is a map of Paris, or Istanbul²⁶, or any number of other cities that were constructed in phases.



Now let's imagine a sculptor throwing a pebble into a lake. Moments after the pebble has disappeared under the surface of the water, not only can he still locate the place where it entered the water but he can also tell how much time has elapsed since it hit.²⁷ He could even commemorate the event by building a replica of the ripple. Next, let's imagine the sculptor never threw the stone; but only thought about doing so. He could still build the replica, even though the event never happened. The resulting sculpture would be fictional! Architects do this all the time, adding their own time sequences to a project, in effect allowing them to be read like books.



Last year, I was fortunate to see the fanciful, inventive sketches of the Korean architect, Moon Hoon, at the Chicago Architecture

²⁶ "Joe Hester: The Memory Rooms" <http://ccaemarch12.blogspot.com/p/joe-hester.html>

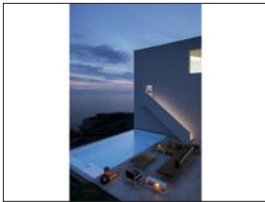
²⁷ Nature provides many examples: Footsteps in the snow, a spider's web, the whiteness that remains after a wave has broken, and the splash that marks the spot where a dolphin has taken air, are all visible representations of the recent past. Paul Klee wrote in his "Creative Credo of *an apple tree in bloom, its roots, the sap rising in it, its trunk, the cross section with the annular rings, the blossom, its structure, its sexual function, the fruit, the core with its seeds- one single organization of states of growth.*"

Biennial. In 2015, contractors completed construction of his subtractive cultural center design for the city of Goyang-si. The project was conceptualized as a giant rectangular concrete volume, out of which has been carved a rectangular void and a sphere. It looks massive from a distance. Yet of course the sphere wasn't actually carved away. It was just built that way. *"Art is the lie that reveals the truth"*, Picasso famously said. When you get up close, you can see that the architect reveals the actual thinness of the construction by deliberately exposing the edges of the concrete walls.



The Japanese architect, Kengo Kuma, also has a fascination with subtraction. His design for the Oribe Tea House, built in 2005, resembles a cocoon from the outside, but when you step into it you feel as though you are in a cave. But what a cave! The space is tiny but feels much larger.

The translucent walls glow with refracted light, creating a mood of spirituality and quiet reverie.



If you are an architect, then you have probably seen recent Portuguese home designs published in your favorite design magazines. This first house is by the Spanish firm, Fran Silvestre Arquitectos.

The second is by the Portuguese firm, Manuel Aires Mateus. Mostly white, their stuccoed concrete construction gives them a sense of simple dignity that relates them to their neighbors. Similar to the designs of Richard Meier in the US, the absence of color and any visible control joints allows your design eye to focus on the building's forms, which are all that remain when everything else has been taken away.



The firm ARX Portugal designed their House in Possanco in 2011 using subtractive techniques that allowed in light from the south, even as the building opens up to views to the north. Roofs, walls, and openings all become one so that the house reads as part of a single monolithic shape. The strong summer sun creates deep shadows that make the building seem even more abstract.

In January this year, the Light and Space artist, James Turrell, donated one of his famous Skyspaces to the Mattress Factory Museum here in Pittsburgh to be installed in 2017. Turrell employs method similar to those employed by architects to subtract information from the visual field until the sky is all that is left. With all distraction filtered out, viewers experience a perceptual shift, freeing



them to see the sky as though for the first time and to interpret it in new ways.

Here in the office, we are currently subtracting mass from both the building and the site of the Aspinwall Marina. Not only are we demolishing two buildings on the site, we plan to remove the roof of another, forming an exterior entry court that brings to mind images of a ruined medieval cathedral, like San Galgano, in Tuscany.



Strategies involving “implied time” are much easier than ever before to develop, visualize and control thanks to current 3D form-making software. In Rhino, the difference command subtracts space from a volume with the click of a mouse. The result is that architects are now free to build immersive subtractive experiences into their projects. Although these experiences may echo those created by subtractive forms in the natural landscape, the computer also allows architects to create unexpected, hard-to-visualize relationships that may not resemble nature at all.

Conceptual Subtraction



I remember being fascinated in my teens with the idea of negative numbers. How could a quantity be subtracted so that it possessed negative existence? Can a thing really go away to the extent that its absence can be defined? The concept was mind-boggling. If you are hungry, is the lack of food in your stomach defined by how much you need to eat? If a relationship ends, is your pain defined by the extent of your former love? If you haven't met someone yet, is their absent presence tangible? “I miss you,” sang Bjork in 1995, “but I haven't met you yet.”

Which brings us to the post-modern concept of “trace”: In the 60's the philosopher Derrida wrote about how every sign is part of a binary pair. Stop-Go. Man-Woman. Subtract-Add. As Susan Sontag wrote in, “Against Interpretation”,

“Silence” never ceases to imply its opposite and to depend on its presence: just as there can't be “up” without “down” or “left” without “right,” so one must acknowledge a surrounding environment of sound or language in order to recognize silence...

Because you can't imagine a sign without also imagining it's opposite, Derrida's belief was that all signs carry around with them traces of their missing partner. Therefore negation - subtracted presence - is intrinsic to language. In literature at least it IS possible to miss the one you haven't met!



In Modern art, these traces occur when paintings exhibit more than one quality at a time. This phenomenon is known as “pictorial

ambiguity”²⁸. For example, in, “Young Italian Woman at a Table”, Cezanne paints the table so that it’s top may be interpreted as flat or sloped and then obscures whether the woman is sitting or standing.



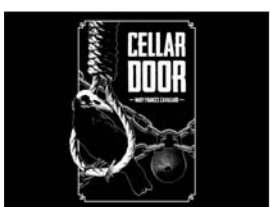
Now it was possible for viewers to “read” paintings in the way they would the world itself, in many ways all at once.²⁹ It soon became clear that the amount of interpretations any painting possessed was practically infinite. Looking at a painting became like visiting a House of Mirrors, where you could see versions of yourself reflected to infinity. So many signs! And for every sign, traces of so many more beyond! Soon artists were attempting in various ways to clarify all these complications by subtracting excess meaning from their work.

“I owe you the truth in painting,” Cezanne once said, “and I will tell it to you”³⁰.



By the early 1960’s the situation had come to a head. Some like Rothko subtracted visual clutter from their paintings until they contained only simple fields of color. Others attempted to subtract aesthetics altogether.

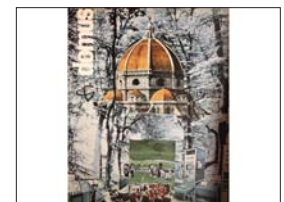
When Joseph Kosuth created a work of art that placed an actual chair next to a photograph of the chair and its dictionary definition, his intent was to subtract as many aesthetic references from the piece as possible. As Kosuth himself said about the piece, he liked it that the work *“was something other than simply what you saw.”*



“Cellar Door”: These are the words that Drew Barrymore’s character in the movie, “Donnie Darko”, stated are the most beautiful in the world.³¹ Suddenly it was no longer important that the words have a pleasant sound when spoken aloud. Instead, what was important was what the words meant after their aesthetic associations were subtracted. It turned out that it was a lot easier to

subtract aesthetics from words than from designed objects.

In 1970 the Italian architects’ collaborative, Superstudio, began to investigate how the concept of trace could be manifested in design.³²



The first project, titled Subtractions / Substitutions, consisted of a series of photomontages in which major monuments—the leaning tower of Pisa, the cathedral of Milan, and the baptistery of Florence—were subtracted from their

28 “Architecture and Psychoanalysis: Peter Eisenman and Jacques Lacan” John Hendrix, Peter Lang Publishing 2006 (p.20)

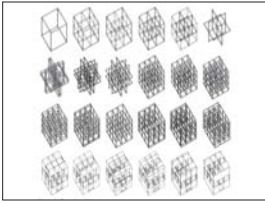
29 “Masterpieces of Painting in the J. Paul Getty Collection” Denise Allen, Getty Publications 1997 (p.109)

30 “The Truth in Painting” Jacques Derrida, University of Chicago Press 1978 (first published)

31 The original remark is by H. L. Mencken, although it has also been attributed to Edgar Allen Poe and J.R.R. Tolkien.

32 “Hidden Architecture: Superstudio’s Magic Box” Pidgin Magazine 19, Sebastiano Fabbrini 2015

*postcard-like views. The aim was to “invent a void in a context with a strong historical and formal definition.”*³³



That same year the architect, Peter Eisenman, began to explore his notion of the “presence of an absence” in the essay, “Notes on Conceptual Architecture: Towards a Definition”.³⁴ For him, presence in architecture - what you see in a building, the classical representation of “*utility, firmness, and beauty*” - was associated with aesthetics; and absence - what you can’t see in a building, its timeless, non-representative qualities - was associated with rhetoric.

Eisenman’s view of architecture was similar to Kosuth’s view of painting. For him, buildings, just like art, possessed far too much aesthetic meaning.

Although architecture from the past was the biggest offender, even modern buildings, because of their associations with industrial forms - grain silos, steamships, sheds and the like - possessed too many signs, which inevitably confused viewers and canceled their ability to truly perceive the work. Eisenman set out to subtract the signs away so that it would become possible to examine architecture at a fundamental level. “*In order for (architecture) to be a cause,*” he wrote, “*it must arise from something outside a directed strategy of composition... To have life, both objects and life must acknowledge and symbolize this new reality.*”³⁵



To Eisenman, a house was not an object in a traditional sense but rather the record of a design process. In his design for House X, columns extend from the ceiling like stalactites but never quite reach the floor. In House VI, the space defined by a slotted bedroom window divides the client’s bed in half, separating husband from wife.³⁶

It was all very interesting but perhaps not so humane. Of course if your primary goal as you design is to illustrate a philosophical point, then your client’s needs may not be at the top of your list...

*Q: What did Peter Eisenman’s son get for his birthday?
A: The Absence of Presents!*³⁷

Eisenman’s idea was that by making the implied subtracted pieces of his fragmented, dislocated forms as present as possible, he increases our knowledge of the original objects. By cutting the bed in two, for example, Eisenman both amplifies and subverts the meaning of it’s original form. As our imaginations automatically fill in the space between the bed halves, we can’t help reconsidering how we sleep.

33 “Adolfo Natalini, Notebook: July 18, 1970” (Florence: Natalini Archive). Translated by Sebastiano Fabbrini

34 “Notes on Conceptual Architecture:” Peter Eisenman, Design Quarterly 78/79, Walker Art Center 1970

35 “The End of the Classical: The End of the Beginning, the End of the End” Perspecta 21, 1984

36 AD Classics: House VI / Peter Eisenman” <http://www.archdaily.com/63267/ad-classics-house-vi-peter-eisenman>

37 “Peter Eisenman the Architect” <http://blog.miragestudio7.com/peter-eisenman/1328/>

That's genius, but it's also willful. He's the one deciding to cut the bed in half. It wasn't arbitrary. It was an act of self-conscious, somewhat nihilistic aesthetics. So even as Eisenman is making his point, he can't help contradicting himself. His architecture is like a small leaky ship afloat in a sea of meaning: Even as he subtracts meaning from the bow, it always slips back in through the stern!

Conclusion



Did Peter Eisenman truly succeed in freeing architecture from the tyranny of aesthetics or was his House VI just another example of Postmodern overindulgence? This image is of the infamous Hong Kong Public Library, built just fifteen years ago. The fact that architectural theory has moved on from that time may provide insight on that subject. Still, subtracting excess meaning from architecture is certainly an honorable quest. Yes of course subtraction can go too far, as when Kubelka advocated abolishing excess in film by banning motion.³⁸ Every concept has its limits.



That being said, the Abbe Laugier, with his primitive hut, was neither the first theorist, nor the last, to advocate the removal of architectural artifice.³⁹ Corbusier, Viollet-le Duc, and Vitruvius all favored a certain pureness of form that could be found by subtracting needless frippery. Each felt that the way to create places with memorable character was to base building elements on forms more connected to their original meaning rather than by mimicking forms from the past.



The Chinese philosopher, Lao Tzu, once wrote that,

“To attain knowledge, add things every day. To attain wisdom, subtract things every day.”



Why do we all have to live in such large houses? For many people, such homes create needless expenses that they neither want nor can afford. My 550sf Irwin Studio presents a convincing minimal alternative. A still more subtractive solution is our new design for a

38 “The Art of Subtraction” Miklos Erhardt & Joanne Richardson, http://subsol.c3.hu/subsol_2/contributors/erhardttext.html

39 A thousand years earlier, Vitruvius had already praised the virtues of simple forms. Eighty years after Laugier's death, Viollet-le-Duc set out in one of his first Lectures on Architecture as professor at the Ecole des Beaux Arts to “...inquire into the reasons of every form- for every architectural art has its reasons; to point out the origin of the various principles which underlie them ...to recall attention to the application which can be made of the principles of ancient art to the requirements of the present day; for the arts never die; their principles remain true for all time.” More recently, Le Corbusier described in Vers une Architecture how twentieth century man “...had forgotten that great architecture is at the very origins of humanity, and that it is the immediate product of human instinct.”

210sf Tiny House.



Certainly subtraction is an important, necessary tool for architects as they design. I have two more points to make: The first is that the concept of subtraction surmounts the work itself. Subtraction not only manifests itself in an architect's product, it also plays an important role in his process.

It is paradoxical that although the creative act is inevitably additive - because we are creating something from nothing - that subtraction is required for it to happen.

The ability to get to the heart of an idea is what separates the best artists from the rest. We express our ideas at first in a jumble. They appear in our sketchbooks as vigorous, confused drawings. Every view contradicts every other view. As we work, we subtract chaos from our visions. We hone them. We clarify. This is the artist's process.

The best buildings are frequently those that the architect has spent the most time designing. The more time we spend unraveling the concepts and the details of the building, the better the result.

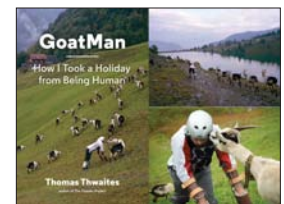


My second point is that subtraction also manifests itself as part of an artist's way of being. How should a creative person conduct his life? People are able to concentrate better when they subtract excess from their surroundings. Typically, we live our lives in a state of Koyaanisqatsi, the Hopi Indian word for "life out of balance". The phone won't stop ringing. Bills need to be paid. The television calls.

Our surroundings pummel us with distractions.

I visited my friends, Rob and Geetha, this morning. They are moving tomorrow morning to Maryland and all their possessions are in boxes. Looking around her living room, Geetha commented to me how liberating it was for her to be separated from all her stuff, even if only by a layer of cardboard.

Just last year the artist, Thomas Thwaites, went to the extreme of pretending to be a goat in order to distance himself from human complexity. For six days he fastened a prosthetic rumen to his chest and ate grass!



Susan Sontag wrote of the artist's need to subtract clutter and surround oneself with silence in order to create important work.⁴⁰ *"The impulse to create begins - often terribly and fearfully - in a tunnel of silence,"* wrote Adrienne Rich in her 1997 lecture on art and freedom. *"Every real poem is the breaking of an existing silence."*⁴¹

40 "The Aesthetics of Silence: Susan Sontag on Art as a Form of Spirituality and the Paradoxical Role of Silence in Creative Culture" <https://www.brainpickings.org/2015/07/06/the-aesthetic-of-silence-susan-sontag/>

41 "Keeping Quiet: Sylvia Boorstein Reads Pablo Neruda's Beautiful Ode to Silence" <https://www.brainpickings.org/2015/05/28/keeping-quiet-sylvia-boorstein-reads-pablo-neruda/>



In the last hour I've introduced the subject of SUBTRACTION and talked about the concept's origin and meaning. Then I introduced examples of literal, formal, and conceptual subtraction in architecture. After that I talked about the architect's process and way of being.

But I could as easily have been talking about addition, or shear, or scale, or gradients. I'm happy to have reinforced the idea that FORM is still important to architects. Architects must process many considerations as they conceptualize their designs. Designing green is important: I'm LEED AP and a bigger supporter of the Living Building Challenge and Passive House standards. Designing affordably is important. The opinions of the owner are super-important. Rigorous drawing sets are important. So are strong engineering strategies.



That being said, studies show that monotony has indelible effects on our psyche⁴². Nature isn't boring. Ideas aren't boring. Why are our buildings? I think the solution lies not in the way we run our practices or the features we add to our designs. I think it lies in the way visitors experience our creations.

Should we revisit Christopher Alexander's theory of a pattern language? What about computational design and the new world of parametrics? Certainly, preserving the existing built environment will always remain important.

Whatever the future will bring I can say this: If developing a set of flexible formal rules for creating buildings helps discourage architects from designing the same building over and over or copying each other's designs, then count me in.



These guidelines should encourage architects to subtract excess meaning from their designs by studying and subsequently responding to a building's true concerns, which are the complete history of its surroundings. Physical environments should result that exhibit a far greater variety of building forms and techniques than at present, alleviating monotony.

It is not contradictory that this new variety should point in the direction of a new coherence, because the meanings that remain will be directly connected to the environments themselves, rather than to arbitrary concerns. As human beings are wired for narrative, ultimately this will allow participants to feel better about themselves.⁴³

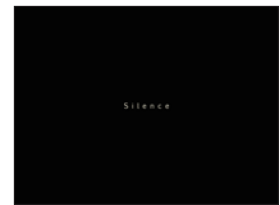
42 "Why Monotonous Repetition is Unsatisfying", Meandering Through Mathematics, Nikos A. Salingaros Reprinted in the Cornell University Library Arxiv, September 2011.

43 "Cognitive Architecture: Designing for How We Respond to the Built Environment" Ann Sussman, Justin B Hollander 2015

Peter Eisenman may not have been able to subtract non-textual concerns from his designs; but he was right to believe that architects have much to learn from literature. I'll end with this: In his poem, "Carta a Leon Felipe", the poet Octavio Paz, author of "The Labyrinth of Solitude", reflected that,



*Poetic writing
is erasing the written
Writing
on the written
the nonwritten
Poetic writing is
learning to read
the hole of writing
In writing
not traces of what we were
Paths
Toward what we are.
...
Poetry
Is the fissure
the space
Between one word and another
Configuration of incompleteness.⁴⁴*



Thank you!
Eric Fisher AIA, LEED AP, 2016