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Mark Zeh
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Dynamic Balance: A Personal Journey

Mark Zeh

A Thesis submitted in partial fulfillment of the requirements for the degree of:

Master of Fine Arts: Furniture Design

The College of Art and Design

School for American Crafts

Rochester Institute of Technology

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Approval Date: _____

Thesis Committee Approvals:

Prof Andy Buck
Chief Advisor

Date

Prof Timothy Engstrom
Associate Advisor

Date

Prof Andy Buck
Grad Director

Date

Glen Hintz
Administrative Chair

Date

Abstract:

My thesis concept is about dynamic balance. I am showing this concept through the table. A table is defined “...as a piece of furniture with a flat top and one or more legs, providing a level surface on which objects may be placed...”¹ The idea of sturdy or stable is not mentioned in this definition or any other that I looked at. Why? Maybe because the concept of stability regarding table attributes is just so taken for granted, so engrained in our consciousness, that we simply overlook the necessity to call out this trait. By the very nature of its functionality a table needs to be stable. I wanted to challenge this idea. Not by making tables that were necessarily unstable, but rather by playing with the **visual balance** of the composition. I hoped to create compositions that depict struggle, a struggle for visual as well as structural balance. My goal was to create a tension within each piece that may be disquieting, while still succeeding as functional furniture. Through this search for balance, as with life, I hope to achieve a deeper level of engagement and, hopefully, a deeper level of fulfillment.

The design for the initial table consisted of a simple under-structure which cants to one side giving it a feeling of barely being balanced and able to stay standing. This table started as a quick project following a stressful spring semester. My intention was to engage, in a more relaxed atmosphere, the design and construction of a piece of furniture which would act kind of like a counterbalance against the previous few months. Little did I imagine this simple piece would lay the foundation for my thesis and even more importantly bring to my consciousness a concept that I have buried within myself and have personally struggled with, The idea of balance.

From this original piece I created three more small wood tables each time making some nuanced changes in the leg structure, joinery, or the top. With these slightly different details I was able to finesse the table and make some conscious investments into developing my idea of balance. I then changed direction regarding material and color on the remaining body of work, creating three metal and glass tables. The first a small side table that was thin and tall and fiery

red. The second a low elegantly poised, gleaming black coffee table and the third piece, I looked at developing a relationship with the wall as part of the dynamic balance I was striving for. With these three pieces I was also using color as an element of balance. I used black, red, and white, with the black and white as the two extremes and the red as a central color with a dynamic finish of swirls and candy apple.

Success varied with each piece as I looked to investigate subtle variations of balance and composition but overall I feel my investigation into the concepts of dynamic balance and the relationship I tried to manifest with the physical pieces and the conceptual idea was not only successful as a body of work but even more so as an inspiration and investigation into my own journey as a designer maker.

Thesis Statement:

The struggle for balance is the primary focus of my thesis investigation. Dynamic balance is the ability of an object to balance while in motion. While my pieces will not literally be “in motion”, they will always be in the process of attempting to gain their equilibrium. I will explore this search for visual and structural balance through asymmetric compositions that function as utilitarian objects. As I create my body of work I am looking to stay grounded by making useful furniture that embodies these concepts.

I will also explore the use of different materials in this body of work. I am interested in the impact these materials have on the structure and geometry of the furniture. I will experiment with material qualities such as weight, strength and flexibility to investigate ways in which they influence the resulting compositions and their function as useful furniture.

I hope to create compositions that depict struggle, a struggle for visual as well as structural balance. My goal is to create a tension within each piece that may be disquieting, while still succeeding as functional furniture. Through this search for balance, as with life, I hope to achieve a deeper level of engagement and, hopefully, a deeper level of fulfillment.

Process:

I believe the idea of balance is engrained in each of us at the very beginning of our consciousness. As babies learning to sit up from a lying position or as toddlers learning to walk we struggle with balance early in our lives. When first learning to walk we stand precariously on two wobbly legs on the verge of collapse. In the beginning we hold on for stability, a parent's hand, a couch, or table leg, tightly clinging and, though tentative and afraid, we eventually let go of the safety of that knowing support and stand frozen in place teetering precariously, alone, as our brain analyzes this strange new place we find ourselves, eventually falling, landing on our bottom. A place we feel safe, secure, and comfortable but again and again we are driven by some unknown force to stand. Each time our teetering becomes more stable, falling less and less until finally we reach out with a single small step into what is a life full of countless steps into the unknown, countless moments of growth, and opportunities to teeter at the edge.

My quest for this “balance in three dimensions of space” has become a journey of discovery and inner reflection. The act of being balanced and solidly grounded invokes in me a calm that at once has a part of me enjoying the warmth of the moment, of being in harmony, being at peace, a place I would've thought I'd want to stay once I found it, but more so then not this place becomes only a momentary respite for my continuing journey. Soon I become restless and find myself drifting without focus or direction. Could it be this dynamic balance is my psyches way of energizing me? Of acting like a gyroscopic energy source that as long as it continually moves and TRIES to find equilibrium it creates this dynamism, this energy, and as soon as it stops moving it becomes just a lifeless static object devoid of energy. Albert Einstein once said “Beim Menschen ist es wie beim Velo. Nur wenn er faehrt, kann er bequem die Balance halten.” “It is the same with people as it is with riding a bike. Only when moving can one comfortably maintain one's balance.”ⁱⁱ It is this energetic feel of dynamic balance that I want to capture with my body of work.

My background before coming to school for furniture design was grounded in the analytical world of business and management where most things are seen through the lens of profit margins, quarterly earnings, and growth potential. I always felt that something was missing in this world that I was involved in. I always felt a sort of disconnect or of constantly being one step behind the pack. It was not until I left that world and began pursuing my growing interests in design and making that I realized there are other ways of looking at things. Coming from a non design background I had to change how I was looking at things. I had to consciously look so much more intently, more deeply and so hard into this chasm of my subconscious until it fundamentally changed how today I look at the world around me. These struggles to see through the veiled ideas in my mind have changed how I see my work and how I look at new ideas. Emmanuel Kant states it well:

Up to now it has been assumed that all our cognition must conform to the objects; but all attempts to find out something about them a priori through concepts that would extend our cognition have, on this pre-supposition, come to nothing. Hence let us once try whether we do not get further with the problem of metaphysics by assuming that the objects must conform to our cognition... if he assumed that the entire celestial host revolves around the observer, tried to see if it might not have greater success if he made the observer revolve and left the stars at rest^{mii}

Emmanuel Kant preface to Critique of Pure Reason

This new way of thinking was an eye opener for me. It revealed so much to me about myself, and about how I have looked at design and how I could look at design. I realized it was here where I felt the most energy. I didn't have to view things from typical points, as static objects I could also look at them from other angles, other foci, other perspectives. Ways that are not typical. This ability to think in this design sense balanced with my linear thinking from the business world has given me a much deeper, 360 deg ability to view my surroundings and envision my designs.

When I first entered grad school I was perplexed at how we were given freedom to design without some kind of rigor or learning of ideas or techniques, some study of past designers, artists, or makers. Where was I to get my ideas from? Coming from a business background I did not have any foundation in aesthetics, design or conceptual foundations from others. I felt thrown into this abyss totally lost and alone. What now? I continued to struggle throughout my

time in grad school. It was not until at the very end as I was putting together all the pieces of my grad school time that I began to see insights into why.

There were conversations regarding this freedom that I did not agree with it. How can I design without knowing at least some things? My insights and absorption of these ideas was slow to sink in and not until I reflected back on my experiences that I came to some conclusions regarding these experiences. When given a chance to design without any information there is a certain freedom from inhibition based on predetermined criteria that allows for the subconscious to engage uninterrupted in its pursuit of an aesthetic design. This freedom is what gave me the absolute most difficult time in the program but looking back I found that some of my best pieces came about because I had this freedom. As I learned more about design and read more and more about designers, makers and artists I found myself wrestling with myself and second guessing my decisions. The more my eyes were opening the harder time I was having with design decisions. Why? I asked myself. I thought at the end of grad school with a deeper design foundation and exposure to ideas and such I would be having an easier time. Again I was stopped in my tracks. I had to figure this out. I needed to be able to at least understand why I was having such problems even if I could not readily resolve them. I knew if I at least figured out the why I would at least have a direction towards growth.

Critical Analysis:

My engagement in the initial table had more of a casual curiosity in contrast to the other pieces in my body of work where the design was driven consciously. When I finally had dialed in the details of the piece I noticed that it had a certain precariousness to its stance. The angles I had designed into the piece, though looking good, lacked stability. The slightest touch in the wrong spot sent it toppling over. At first I was frustrated. I had focused quite a bit of energy and time into this small, simple table and the culmination was a table that was so precariously perched I was afraid to put even an empty glass on it for fear of it toppling over. In my mind I wrote this piece off as a failed attempt. A table should be able to hold what is placed upon it! I set it aside and worked on other designs, mock ups and models but my eye kept being drawn to

this simple little table. I really enjoyed the stance it had. There seemed to be a certain angelic quality to how it took up space. Time and time again I would find myself stopping what I was doing and just stare at this unassuming piece. I would take it out from behind the detritus of the studio space, move stuff out of the way and place it in the middle of the studio. I would turn it around again and again so I could look at it from different vantage points. Something intrigued me about this piece but I could not yet pull these unconscious thoughts to the front of my brain for assimilation into my aesthetic consciousness.

I finally decided to make another one but before starting work on this second iteration I sat down to analyze the original in a more objective way. I knew the table had a lack of actual stability that needed to be addressed. Subsequent tables needed to actually perform as such. On the next three table iterations I dialed in the angles and tapers and placement of the table top in space and in relation to the base. In all I made 4 tables. I decided to group these tables together to create a single work.



“Angular Table Series” (Chronology from right to left)

During my work with the “Angular Tables” series, though satisfied with the development through each of the four pieces, I was struggling with resolving the table tops themselves. For the first table I created a simple solid wood top with a figured piece of cherry I had in my wood collection. This top, though nicely figured, seemed out of place, like an add on at the last minute, which in reality, it was. When making this piece I was more focused on the base thinking that the top, like most tables, would be a simple piece of flat wood added at the end to complete the composition. This approach left me with a base and top with separate merits but together they reminded me of a prearranged marriage. The relationship the top had with the base also seemed chunky and top heavy. This result, though frustrating, helped instill in me a lesson that was taught early in the MFA program; that when designing, the whole piece needs to be considered, questioned and investigated no matter how mundane the part may seem. This idea was to be solidified as I progressed in my thesis work. What I also realized was that though I struggled, painfully at times, with the final designs of each piece not knowing the end result at the beginning of the process put me in a situation that left me in one way frustrated but in another it also pushed me to dig deeper into myself to see the piece’s potential and final form emerge in a more dynamic way.

The remaining three tabletops were developed to different degrees with the base being its constant design connection. I played with different fabrication techniques and attachment options. One of the tops was a MDF substrate with a solid wood edging with the whole being laminated on both sides with a cherry veneer. This gave me the ability to play with grain and figure while exploring the stability of having a very thin core made of MDF. Another top was made of solid wood though much thinner and shaped to reflect the base and another still was solid cherry with a taper from the center to the edges. My results were exciting, giving me stronger confidence and drive to explore in more depth the opportunities available in working these materials and techniques.

Through the development of these four tables the base design began as heavier pieces with joinery being butted to each other. Though this joinery was structurally strong it was also visually strong interrupting the flow of the wood grain.



(Table base joinery detail (center 1st iteration, rt 2nd iteration, lft 3rd iteration)

With the idea of “form following function” I needed to not only create in the other pieces this visual continuity I also needed to make sure I balanced this with structural integrity. The three remaining pieces needed the joinery to be sympathetic with the grain, structurally strong and visually delicate. With the first piece I used butt joints with pegs and splines. The second piece I eliminated the pegs and splines but used the butt joint again. This softened up the look but was still lacking that fluidity I wanted. I decided to use mitered joints on the remaining two pieces. This continual grain created a more fluid movement from beginning to end.

Of the four tables three had the bottom foot, where it met the leg of the base, taper towards the end leaving the thickest part at the actual connection of the leg creating two tapers one from this joint to the toe of the base and one from the foot to the neck. Though this seemed to work conceptually and structurally it did not give the seamless visual flow I was looking to capture with mitered joinery. So following feedback from my committee I began the final piece as a single continuous tapered base that was heaviest from the toe of the base and continued its taper through the base until it met the table top where it was at its thinnest. This definitely helped resolve the visual flow problem and it also helped with the stability of the piece by giving solidity to the area of the table that was most tipsy.

I also needed to be creative in the use of tenons to give added strength to the delicate joints. A typical tenon is a piece of wood that fits into the corresponding hole or mortise.

Because I had such little depth to work with my tenons though needing to be long didn't have the room to be straight so instead I had to devise a way to keep the glue surface as large as possible but the tenon as small as possible. What I ended up doing was making tenons from plywood utilizing the cross-grain nature of the plywood to my advantage. I cut each one into an "L" shape thus giving me the stability I needed in a smaller package.

These three tables also saw the base develop greater delicacy with more pronounced tapers and smaller joinery areas that created more visual tension as these smaller joints seemed bird like in their delicacy. What was a most exciting result of the exploration in these pieces was each subsequent table base, though smaller and more visually delicate, was actually gaining in stability to a point where the final version was both the most stable as well as the most delicate in its composition.

These first tables, like I said, form a single grouped piece helping me investigate balance through the development of the angled motion of the base's individual pieces as well as the incorporation of the table top itself into the design. Seeing the pieces folding and leaning, filling the space in this interesting way got me thinking on where to take this idea next.

Shift away from wood:

While working on this first series I was already reflecting on other ways to manifest this idea of dynamic balance. I felt I had pushed to a certain limit the thinness of the wood pieces and the joinery. The wood I felt was now becoming a hindrance in my continued exploration of this idea of dynamic balance. The structure of the wood tables has the wood oriented on edge so the joinery surfaces are more inclined to be structural but I began thinking about how to continually thin the material yet still have a piece that had structure. A previous metalworking class had given me some exposure and experience working with metal and welding so I took this direction of exploration. With metal I can orient the pieces on their surface and bend and weld the base into a form that had no joinery, this accomplished two things. First it eliminated the weak link of the mechanical joint and second it gave a more streamlined look to the pieces, a continuation of the fluidity in the motion. I began my investigation into using metal by taking small sheet metal pieces and bending them into various configurations and angles. I would stand them up, lay them on their side, and lean them against the wall. I made a variety of templates for

the tops representing wood, glass and metal trying to figure out what might work. I finally decided on a direction for the pieces. Again, without the tops being dialed in I jumped into getting fabrication work started. With just enough metal fabrication experience to get into trouble I found a metal fabrication company that was willing to not only take on my designs but they also allowed me to be engaged in the process as well, this included welding, grinding and bending the metal. Over a two-week period I ended up with three forms that excited me. But a form does not make a piece...so though I had these forms I had a lot of design work ahead of me still. All the final details were not dialed in as I could only get to a certain point on the models before I needed to go to the real thing. I spent months with these pieces working out how they would ultimately end up. I did countless mockups of tops and positions with them. I reworked one of them to give more rigidity and form, I made false starts regarding tops. A veneered top with a tapered torsion box structure fell flat and solid wood was a concern because of how precariously it was attached to the base. Since it was only attached at one corner my committee was concerned for its long-term stability. Ideally my pieces needed to be structurally sound and yet look precarious. It could not be precarious! I experimented with some finishes including a technique that had me applying boiled linseed oil and heat to try and create a type of blackened look. Though I had some interesting moments the overall result was lacking so I put the finishing off for a while and continued working on finalizing the bases.



1st Metal Table with wood top

My ideas for the first metal base were for the most part set. What I found though was how just a few degrees can alter a piece's stability. Such a little bit yet such a big deal. When I finished the piece it wanted to tip to one side. I had pushed the precariousness too far in this case and had a base that was not stable. I did not want to abandon the piece though as I felt it still had merit and just needed a bit more attention. I tried a few ideas to stabilize it yet still keep its visual imbalance. I first added a few degrees of taper at the bottom giving a tapered look to it that looked good, yet the instability problem was still there. Second, I added to the underside of the foot approximately 80lbs of lead to help lower the center of gravity. This also helped but I still was not totally satisfied. It was not until I went through the design process for the top that everything finally came together.

Like I mentioned my original top was a tapered torsion box that was long and "L" shaped this did not work visually but I realized that with an overhang going back over the base gave me the stability I needed. Before working on a second top I redirected my efforts at finishing moving away from the boiled linseed oil and towards a dazzling candy apple red finish that was

transparent and showed the pattern of grind marks I had worked into the metal. This gave the base a colorful wow factor and with the grind pattern a sense of energy and movement. I wanted the top to reflect this movement and decided on a tapered solid wood top that reflected the shape of the foot. The top was made from curly maple which has a very dynamic figure to it that I felt would continue to excite the viewer with this movement. To a certain amount it did but I also found it was trying to compete with the base and also the relationship of the wood to the highly polished candy apple red was not creating the relationship I hoped it would. This, furthered by feedback from my committee, the way the wood top was attached, though interesting and reflecting that dynamic balance, concerns were voiced as to the longevity of the piece as a working table. The top needed to stay flat and true and one of woods characteristic is to move and twist if not controlled. I set this piece aside for the time being and continued my focus on the next metal base.

Metal base two was the first piece I actually named. I call it “ONYX” I wrestled with this piece even more so then I did with all the others and was at an emotional breaking point. Time was not on my side. I was weeks behind and well pasted all deadlines. Balance would not be a good word to describe this moment. This is the piece that optimized the idea of tenacity for me. I was truly at a breaking point and was wrestling with the idea of just walking away from this fantasy of grad school. Chalking it up as a life experience and moving on.

“ONYX”

The three years proceeding up to this pivotal moment was both one of the most rewarding times of my life and yet also one of the most difficult. I had been living the concept of dynamic balance my whole time in school. I was trying to immerse myself fully in this opportunity and get everything out of grad school that I could while in the mean time working a part time job and teaching as a grad assistant and last but definitely not least was maintaining a balance within my personal life with my wife and small children. My wife was the structure that lifted me up and kept me moving forward and not giving up. She was that ultimate few degrees that were the difference between tipping over and being dynamically balanced. To her I will always be grateful.

Following yet another exasperating night of no progress I laid ONYX down on its side and went home for the few hours of sleep before dawn. The following day, though still exasperated, I was rested and determined. My usual routine when arriving at school was to get a cup of coffee and sit in my studio for a little while and assess my day. It was this moment that I stared at the base both cursing it and questioning it. Like a Zen Koan the silence of the piece was immutable and unresponsive. It would not reveal its ultimate self to me until I understood its essence. And finally I did.

Great doubt; great enlightenment

Little doubt; little enlightenment

No doubt; no enlightenment

“Zen Koan”^{iv}

Throughout the design process I always had the base upright laying it down only to stabilize it when I was away from it as I did not want it tipping over and falling. Only once during an impromptu meeting with my advisors Rich and Andy was the piece ever laid down on its side and reviewed in a design sense. But I did not have this epiphany yet. Possibly I was too exasperated to see it or too demanding of the piece to bend to my will to hear its voice. To me laying it on its side took away all the precariousness that was there when it was “standing up” Not until that moment sipping coffee and letting go of my emotions was I able to SEE the piece and what it wanted to be. George Nakashima said, "Each flitch, each board, each plank can have only one ideal use. The woodworker, applying a thousand skills, must find that ideal use and then shape the wood to realize its true potential." ^vand it needed to speak to our inner self. I reflected on these words in this moment. The true essence of this form was finally made aware to me in such clarity. The finished piece was already in my mind's eye with finished color and a top. It made perfect sense to me and gave me all the direction I needed to complete it. I set upon this table with such energy and focus.

The final result was a coffee table balancing on one edge of the base and on a single point on the opposite side. This gave the piece such an elegant, delicate stance that was, to me, the epitome of balance in motion. I painted the piece with black automotive paint and finished it to a super high gloss mirror finish and capped it with a glass top that was the same shape as the base

before I bent it, making for a wonderful relationship. Looking through the glass top into the black finish was like looking into the depths of my own being.



“ONYX”





Details of “ONYX”

Following the completion of this piece I began working on a final table. I had a few things worked out so I felt a bit ahead of the game. I knew I wanted a high gloss white finish, I had the rough form welded but I still was not feeling completely confident. I felt so good about the previous piece I needed to try to match or do better on this final one. This is where new troubles arose.

I was confident in my direction now but was having a difficult time pulling in a finalized design. I did not want to make a second coffee table and I also felt I wanted to create a piece that had a different visual balance. I could not get the piece to work as a freestanding base as the top was too heavy and would tip too readily especially with heavy glass top that was part of my visual connection with the other pieces. Referring back to Richard Serra’s work I began experimenting with incorporating a wall with the piece. Originally this was not working as it looked too static simply using the wall as a way to hold the piece upright. I did not see or feel a dynamic connection or a relationship between the wall and the table. I wanted to portray a relationship of tentative cooperation. I came to the decision to not just put it against the wall for support but to actually lean it against the wall. This gave the wall a certain center stage responsibility without detracting from the piece itself.



Richard Serra's work left to right Corner Prop No.8 (Orozco and Siqueiros) 1983, *Prop* 1968, Installation view of "Nine Young Artists," 1968, at the Solomon R. Guggenheim Museum, New York.^{vi}

While going through the design process with this piece following on the heels of "ONYNX" I felt much of my design was being forced. Unlike "ONYNX" which had all the pieces connect so smoothly and effortlessly this piece resisted and I never actually fully resolved all the issues this piece had. This had me thinking about designing in general and my designing in particular. I looked back on when I first started and where I am now. What changed? Where was I stuck? Where did I grow or not grow?

With "ONYX" I experienced the fluidity of design inspiration coupled with the intimate relationship I get when the piece seemingly creates itself from a place within me that I only get rare glimpses. Having this experience with "ONYX" was such an important point in my design experience. It showed I have the ability to pull together the creativity within me balanced by the external environment that also has tremendous pull on me and work through the grind of the day to day work to realize a successful piece.

The final piece was indeed not as transcendently created as the previous but though I struggled with the final iterations of my body of work I had the success of "ONYX" as a counterbalance to my design struggles with this piece. I was able to balance my doubts and confusions with the confidence that my trajectory was right. With this confidence I pushed through the design hurdles and technical limitations and was able to pull together a piece that though lacking in certain design finesses I feel was a successful culmination to my body of work.

What I learned from this piece could be even more important than what I learned from the success of "ONYX" in that as long as I have the confidence to believe that I can create successful pieces this foundation will give me the drive to work through doubts, dead ends and false starts and enable me to look with a deeper focus knowing I CAN design.

Conclusion

My journey for my thesis began before I actually started at RIT and ends after I have left. I made a conscious decision to change my life goals a year before arriving at RIT. I took my balanced life of work and family and tipped it on edge when I decided to leave the world of business and realize my passion as a designer maker. Unknowingly at the time that decision was to lay the groundwork for my culminating body of work and even more importantly reveal to me a deeper understanding of who I am. My thesis idea about dynamic balance began with just a body of work that had the physicality of precariousness and visual instability but soon grew into a whole internal battle within myself as this idea of dynamic balance consumed me. My initial struggles creating pieces were intensified by my subconscious wrestling with the idea of balance as a personal experience. I questioned myself over and over as to why this was so difficult to create these pieces. It was only towards the end that I realized this intense struggle was not only about the pieces themselves but more so about my personal struggle for balance. Each piece in its own way revealed things about who I am and to allow me to more deeply experience a more colorful life. When I finally realized there was this internal struggle going on it began to make sense as to why I was struggling so much and also how to begin to incorporate it into my confidence to design. This is when things got more fluid creatively and “ONYX” was born.

“ONYX” is just a small but important milestone in this journey I have set myself on. The road will be long winding and it’s full of challenges as I look to balance this newly discovered part of who I am with the rest of who I know I am. I have learned walking the line between balance and unbalance is the place where discoveries are made, and lessons learned.

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ⁱ Dictionary.com Collins English Dictionary - Complete & Unabridged 2012 Digital Edition © William Collins Sons & Co. Ltd. 1979, 1986 © HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012

ⁱⁱ 2/5/1930 In a letter to Eduardo Einstein, Albert's son, Courtesy of Barbara Wolff, Einstein archives, Hebrew University, Jerusalem.

ⁱⁱⁱ Kant, Immanuel. Critique of Pure Reason: (Preface B/XVI)

^{iv} Mentioned by Boshan Yuanali who was a Chinese Zen Master of the Ming Dynasty, who lived from AD 1575 – 1630. He attributes this saying to the “old worthies”, Zen masters of old.

^v Nakashima, George. Soul of A Tree

^{vi} EX Richard Serra's work left to right Corner Prop No.8 (Orozco and Siqueiros) 1983, *Prop* 1968,, Installation view of “Nine Young Artists,” 1968, at the Solomon R. Guggenheim Museum, New York.