VERTICAL LANDSCAPES

learning from a rock climbing perspective

Ellie Murray

A thesis
submitted in partial fulfillment of the
requirements for the degree of
Master of Landscape Architecture

University of Washington
2021

Committee:
Julie Johnson
Branden Born

Program Authorized to Offer Degree:
Landscape Architecture

University of Washington

Abstract

Vertical Landscapes: Learning From a Rock Climbing Perspective

Ellie Murray

Chair of the Supervisory Committee:
Julie Johnson
Landscape Architecture

Within the field of landscape architecture, verticality is predominantly defined as a design tool. The variety of applications for vertical elements within design, and the spatial role they can play is well documented. However, there is a rapidly growing community that understands vertical spaces as inhabitable places: rock climbers. More and more people equipped with this unique perspective of the vertical are venturing out to monoliths of rock across the country, seeking new heights in various state and national parks. This perception of vertical spaces as places brings a new definition of the vertical to landscape architecture. To begin to understand this definition, this thesis explores the meanings, values, and experiences of rock climbers by utilizing Yosemite National Park as a case study along with firsthand knowledge of the sport. Placing landscape architecture in conversation with rock climbing presents a number of takeaways for the profession including a shift in the perception of vertical space and the way it is designed, a tool for developing knowledge related to the vertical, and a deeper understanding of the embodied experience of rock climbers. With this recognition, landscape architects can better design for and with rock climbers to protect and manage climbing areas as well as create new opportunities for vertical experiences.

VERTICAL LANDSCAPES

learning from a rock climbing perspective

Image Source:https://www.nps.gov/yose/planyourvisit/climbing.htm

ACKNOWLEDGEMENT

I would like to acknowledge that we, in Seattle, are on the unceded ancestral lands of the Coast Salish Peoples, the land which touches the shared waters of all tribes and bands within the Duwamish, Puyallup, Suquamish, Tulalip and Muckleshoot nations. We honor the Coast Salish Peoples of past and present and honor, with gratitude, the land itself.

Thank you to my thesis committee, Julie Johnson and Branden Born, for your patience, guidance and humor throughout this process. You never failed to believe in me, and challenged me to push this project to its full extent. Thank you to my classmates who provided endless emotional support and a critical eye. Thank you to my friends and family for continuous encouragement, nourishment and support, and for never letting me stop climbing.

CONTENTS

LIST OF FIGURES

All images and graphics by author, except where otherwise noted

1 INTRODUCING THE VERTICAL

"We had forgotten that the mountain still holds the master card, that it will grant success only in its own good time.

Why else does mountaineering retain its deep fascination?"

- Eric Shipton, in 1938
Upon That Mountain[1]

I grew up in the Pacific Northwest, just east of Seattle, between snow covered mountains and sparkling blue lakes, and surrounded by towering evergreen trees. I've always been drawn to the outdoors, felt the pull of nearby adventures to be found. My family spent countless winters skiing in the Cascade Mountains and even more summers hiking through Olympic National Park.

At some point, these activities began to feel almost mundane. Exploring these grand landscapes had become routine weekend activities. I yearned for a greater challenge, a way to experience nature from a different viewpoint, something that allowed me to get further away from urban life and overpopulated trails. I wanted to experience the true force of Mother Nature.

So I turned to mountaineering. Without any prior knowledge of the sport or connections to potential climbing partners, I applied to an intensive three month long course. While this experience taught me a lot about crossing glaciers, climbing icy slopes and accessing

those deep reservoirs of perseverance and determination that we all possess, I discovered that my true passion lay not in bagging peaks, but in the activity we used to train for alpine conditions—rock climbing.

This spring marks four years since I first ventured into the sport of rock climbing. When I'm on the wall, whether that be at the local gym or an outdoor crag, everything else falls away. Nothing matters but the exact moment I am in. No worries, thoughts or emotions can penetrate my all consuming focus. I am the most confident, empowered, peaceful version of myself when I am climbing. Every time I touch the rock, I discover something new, another nuance existing within nature I had yet to observe. Each move in and of itself brings these revelations, and the climb as a whole presents another unique way to move through the outdoors. The wall is where I feel the most connected to nature and the most connected to myself.

I carry this knowledge of the vertical with me. It has shaped and reshaped how I see and interpret the world around me in both urban and remote settings. This other way of knowing has enhanced my understanding of movement, ecology, geology, and spatial relationships, among other things.

The American Modernist poet Wallace Stevens alludes to the multiplicity of knowledge in his poem titled *Thirteen Ways of Looking at a Blackbird* (shown in figure 1). Each stanza, read alone, provides one viewpoint, or knowledge base, related to blackbirds. However, when all of the stanzas are read together, a more robust story, or knowledge base, is revealed. This poem serves to explore the many layers of knowledge and illuminates the value that can be found in each. All the while, piecing these various perspectives together forms a great understanding of the whole. This is to say that I have benefited, on a personal level, from the additional viewpoint that rock climbing has provided me. We, as landscape architects, can benefit from this knowledge as well.

In an interview with Spencer Bailey, Tom Kundig, of the Seattle based collaborative design firm Olson Kundig, discussed the influence his background in mountaineering and rock climbing has had on his work.[4] Kundig talked about how climbing helped solidify his relationship with the mountains and, ultimately, landscape. This relationship allows him to have a deeper understanding of the landscapes within which he designs. He lets this understanding influence the architecture, allowing him to create more meaningful and contextual spaces.[4] Kundig observed that only once you have climbed to the top and looked down, do you truly comprehend

Figure 1: A hand pulled linoleum block print by Joan Colbert titled *Eye of the Blackbird*[3] next to Wallace Stevens' poem, *Thirteen Ways of Looking at a Blackbird.*[2]

Thirteen Ways of Looking at a Blackbird

By Wallace Stevens[2]

I
Among twenty snowy mountains,
The only moving thing
Was the eye of the blackbird.

II
I was of three minds,
Like a tree
In which there are three blackbirds.

III
The blackbird whirled in the autumn winds.
It was a small part of the pantomime.

IV
A man and a woman
Are one.
A man and a woman and a blackbird
Are one.

V
I do not know which to prefer,
The beauty of inflections
Or the beauty of innuendoes,
The blackbird whistling
Or just after.

VI
Icicles filled the long window
With barbaric glass.
The shadow of the blackbird
Crossed it, to and fro.
The mood
Traced in the shadow
An indecipherable cause.

VII
O thin men of Haddam,
Why do you imagine golden birds?
Do you not see how the blackbird
Walks around the feet
Of the women about you?

VIII
I know noble accents
And lucid, inescapable rhythms;
But I know, too,
That the blackbird is involved
In what I know.

IX
When the blackbird flew out of sight,
It marked the edge
Of one of many circles.

X
At the sight of blackbirds
Flying in a green light,
Even the bawds of euphony
Would cry out sharply.

XI
He rode over Connecticut
In a glass coach.
Once, a fear pierced him,
In that he mistook
The shadow of his equipage
For blackbirds.

XII
The river is moving.
The blackbird must be flying.

XIII
It was evening all afternoon.
It was snowing
And it was going to snow.
The blackbird sat
In the cedar-limbs.


LA SPORTIVA
LA SPORTIVA

the vast, complex, beautiful landscapes that surround us. The embodied knowledge that comes from traveling across vertical landscapes allows for a connection to the land of such magnitude that is otherwise rarely known.

How may exploring vertical landscapes through rock climbing hold similar design insight and inspiration for landscape architects? Landscape architects tend to focus on vertical elements as design tools, and unless part of that culture, unaware of the value rock climbers find on these vertical landscapes. These vertical walls are not just spaces occupying vertical dimensions but inhabitable places that foster unique experiences and values. Therefore, the research question I examine through this thesis is:

What can landscape architects begin to understand regarding the meanings, values, and experiences of vertical space?

This thesis is not intended as an exhaustive understanding of this question but rather a first step in landscape architects viewing verticality in a new way. As the American Society of Landscape Architecture's website states, "landscape architects lead the planning, design, and stewardship of healthy, equitable, safe, and resilient environments."[5] Further, the society's mission "is to advance landscape architecture through advocacy, communication, education, and fellowship."[5] My primary goal of acknowledging lived experiences within vertical space, a space neglected thus far by landscape architects, is strongly aligned with the mission of the American Society of Landscape Architecture. Through the initial knowledge base collected in this thesis, landscape architects can better understand, advocate and design for rock climbing communities and places.

Endnotes:

1. Krakauer, Jon. *Into Thin Air: a Personal Account of the Mount Everest Disaster*. New York, NY: Anchor Books, 1997.

2. Stevens, Wallace. *The Collected Poems of Wallace Stevens*. New York, NY: Alfred A. Knopf, 1954.

3. "'13 Ways of Looking at a Blackbird.'" Bolstered By Thoughts, November 17, 2015. https://bolsteredbythoughts.weebly.com/blog/13-ways-of-looking-at-a-blackbird.

4. Bailey, Spencer. Tom Kundig on the Parallels Between Mountain Climbing and Architecture. Other. Time Sensitive, November 6, 2019. https://timesensitive.fm/episode/tom-kundig-on-the-parallels-between-climbing-and-architecture/.

5. American Society of Landscape Architects. "About: ASLA Mission, Vision, Values and Culture." ASLA. Accessed April 19, 2021. https://www.asla.org/ContentDetail.aspx?id=58578.

2 VALUING THE VERTICAL

"You cannot stay on the summit forever; you have to come down again. So why bother in the first place? Just this: What is above knows what is below, but what is below does not know what is above. One climbs, one sees. One descends, one sees no longer, but one has seen. There is an art of conducting oneself in the lower regions by the memory of what one saw higher up. When one can no longer see, one can at least still know."

- René Daumal
Mount Analogue[1]

The academic field of landscape architecture has thus far neglected to study the vertical landscape as another dimension of occupiable place. This chapter serves to identify these gaps within the existing literature, and begins to demonstrate the importance of considering vertical space through the lens of rock climbers. With the use of a theoretical framework centered around the production of space, I propose a case study approach to reveal the meanings, values and experiences of rock climbers.

Identifying the Knowledge Gap

Within the field of landscape architecture, verticality may be conceptualized as a limitation or an opportunity; a way to frame a view or obstruct it; a tool to define space or identify an edge. Vertical planes are understood by landscape architects as means to shape spaces. Rock climbers, on the other hand, view vertical spaces as

places. The lack of academic study around vertical planes within landscape architecture concerning the latter definition of the phrase has been noted, as described below. A further search for research related to verticality, landscape architecture, and place yielded few results.

Norman Booth, a registered landscape architect and professor emeritus at the Ohio State University, underscores this gap in his book *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*, published in 2012.[2] It is what is left out of the discussion in this book that is important. Many chapters demonstrate how verticality has been studied as a tool within design.[2] The range in materiality, opacity and height of vertical spaces within design are briefly mentioned in reference to how these qualities can alter the experience of a place.[2] Verticality as a tool is further depicted as a way to create an edge or corner condition, an opportunity to direct and frame views, and a way to create and divide space. While this book effectively communicates the various ways verticality can be used in creating and defining spaces, another dimension of verticality is overlooked-the study of vertical walls themselves as spaces to occupy.

No significant body of research around vertical landscapes as inhabitable places exists at this moment. Turning to other fields has offered little insight into the general topic of vertical landscapes. A case study from the *Journal of Sociolinguistics* illustrates this point.[3] The case study began to conceptualize the vertical landscape through a focus on the International Finance Centre in Hong Kong. While the presented research is centered around the field of sociolinguistics, the call for recognition of vertical space is applicable to landscape architecture. The authors write, ". . . what might be referred to as a 'flat earth' approach has dominated the discourse of academic disciplines on spatial geographies as in geopolitics, urban design and critical urban research. It is therefore unsurprising that this discursive flattening is also found in other academic domains where landscape is a prime concern."[4] Landscape architects' prime concern is the landscape and thus it can be concluded that the field has applied this flattening of landscapes to a more comprehensive understanding of all spaces. However, this is directly at odds with the lived human experience, which is fundamentally three-dimensional.[3] More specifically, there is an expanding group of people, rock climbers, experiencing vertical landscapes in ways that encourage landscape architects to reexamine the study and theorization of verticality.

Educator, artist and landscape architect Catherine Dee also acknowledges the lack of vertical exploration in the field of landscape architecture. Dee discussed this viewpoint as it relates to mapping and the bodily experience of place in a piece she wrote in 2004 for the *Landscape Research Journal.*[5] She described the use of alternative forms of cartography in understanding landscapes, primarily at the large, or planning, scale.[5] Dee argued for the "need to extend the notion of mapping into vertical planes . . . to provide new perspectives on landscape meaning and experience."[6] This point was elaborated as she touched on the potential for mapping at smaller, more intimate scales (as opposed to the larger, planning scales aforementioned).[5] By focusing on a more local scale, she noted, the bodily experience of a place can begin to be expressed through cartographic practices.[5]

As Dee observes, coupling the expansion of mapping practices to include vertical planes with lived experiences of those spaces can provide landscape architects with a newfound understanding of the landscape. This directly translates to the activity of rock climbing. As travelers of the vertical dimension, rock climbers have methods of depicting, communicating, and mapping the vertical plane. Further, movement through vertical space is heavily, if not entirely, dependent on gravity-defying bodily motion. This unique experience of place becomes embodied knowledge, held by all climbers. Therefore, rock climbers can provide landscape architects with firsthand knowledge and experience of vertical places.

The Rise of Rock Climbing

Not only are rock climbers experts on the vertical, they are also growing in numbers. Over the last decade, the sport has exploded with countless climbing gyms opening in urban settings and throngs of people pursuing outdoor walls. With two major climbing films, *The Dawn Wall* and *Free Solo*, making their debut in theaters in 2018, and the introduction of the sport in the 2021 Olympics, rock climbing is inevitably poised to go mainstream.[7]

Evidence to support this trend can be found by looking at the growth of indoor gym climbing over the past ten years. Data related to indoor climbing is easier to quantify than numbers related to outdoor climbing because gyms keep records of the number of members and the number of signed safety waivers.[7] This type of paper trail is not associated with outdoor climbing as most outdoor walls do not require such information. The average annual growth of the indoor climbing wall industry between 2012 and 2017 was estimated

to be 3.9% in the United States.[7] In comparison, the gym, health, and fitness club industry grew approximately 2.8% over the same period of time.[7] There are over 450 commercial climbing gyms in the United States, ten of which are located in Seattle alone, and more are opening every month (see Figure 1 on following page).[8] Further, the American Alpine Club found that climbing gym facilities yield an average of 102 new members per month and almost 4.4% of the population climbed indoors in 2018.[9] This trend is not unique to the United States either. The International Federation of Sport Climbing has seen a 25% increase in membership over the last decade.[7] This matters, as some of the world's best climbing lies within the United States; climbers are willing to travel far and wide to get on the best rock. There seems to be no stopping the rapid growth of rock climbing either. The sport of climbing, as a whole, contributed $12.45 billion to the economy in 2017[9], while the climbing gym industry is projected to make over a billion dollars in revenue in 2021 (see Figure 2).[7] Additionally, a number of states with large population clusters remain without any climbing gyms.[7] This suggests there are plenty of opportunities for climbing to continue to expand across the country.

How does this translate to the number of people rock climbing outside? The answer to this question is more ambiguous. The Outdoor Foundation released an Outdoor Participation Report in 2017 that starts to unpack this. The report compares the growth of two categories of climbers: sport/indoor/boulder climbers and traditional/ice/mountaineering climbers (see Figure 3).[7] While these categories are not the most specific, they can be generalized to represent indoor gym climbers and outdoor climbers, respectively. The graph clearly indicates a greater total number of people participated in gym climbing (approximately 4.9 million people) in 2016 in comparison to outdoor climbing (2.8 million people).[7] However, the number of people climbing outside is increasing at a faster rate than people climbing in gyms. Outdoor climbing participation almost doubled between 2015 and 2016 with 2 million people climbing in 2015 and 2.8 million people climbing in 2016. Indoor climbing, on the other hand, grew from 4.5 million participants to just 4.9 million participants over the same period of time.[7]

All of these numbers come together to illustrate the existing and growing demand for rock climbing. The indoor climbing industry can respond to this demand by simply building more gyms. The outdoor climbing ecosystem, however, is not as malleable. Vertical walls are a limited resource and developing a new outdoor climbing area takes an abundance of community and individual effort.[7] The rapid growth of this sport has put an undue burden on this natural resource.[8] While the number of people rock climbing indoors far surpasses that of outdoor climbers, as long as the number of gym climbers

Figure 2:

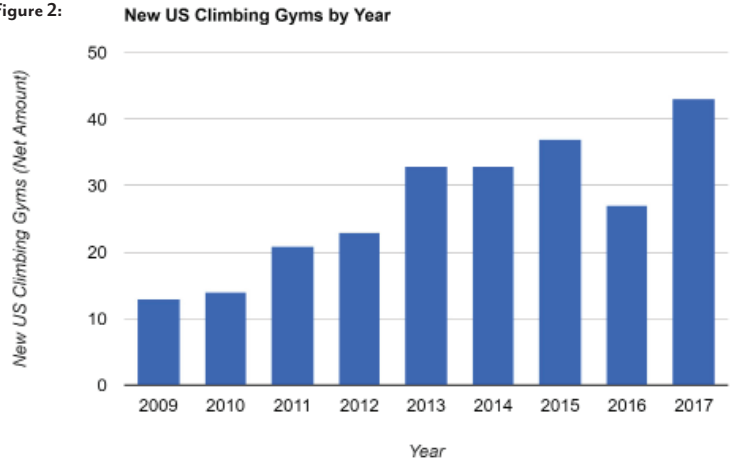
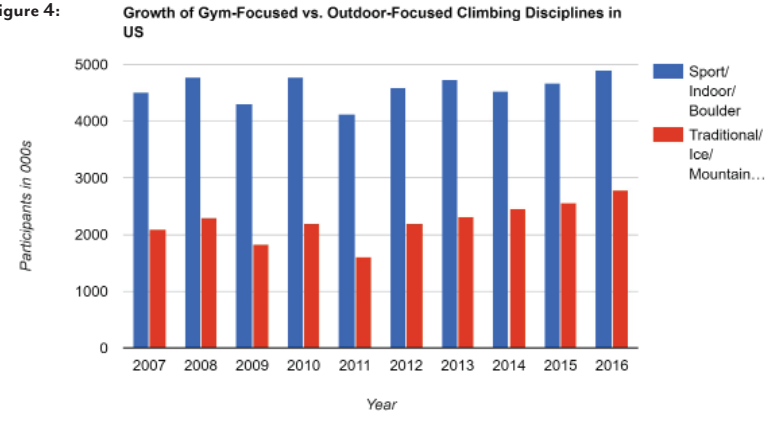
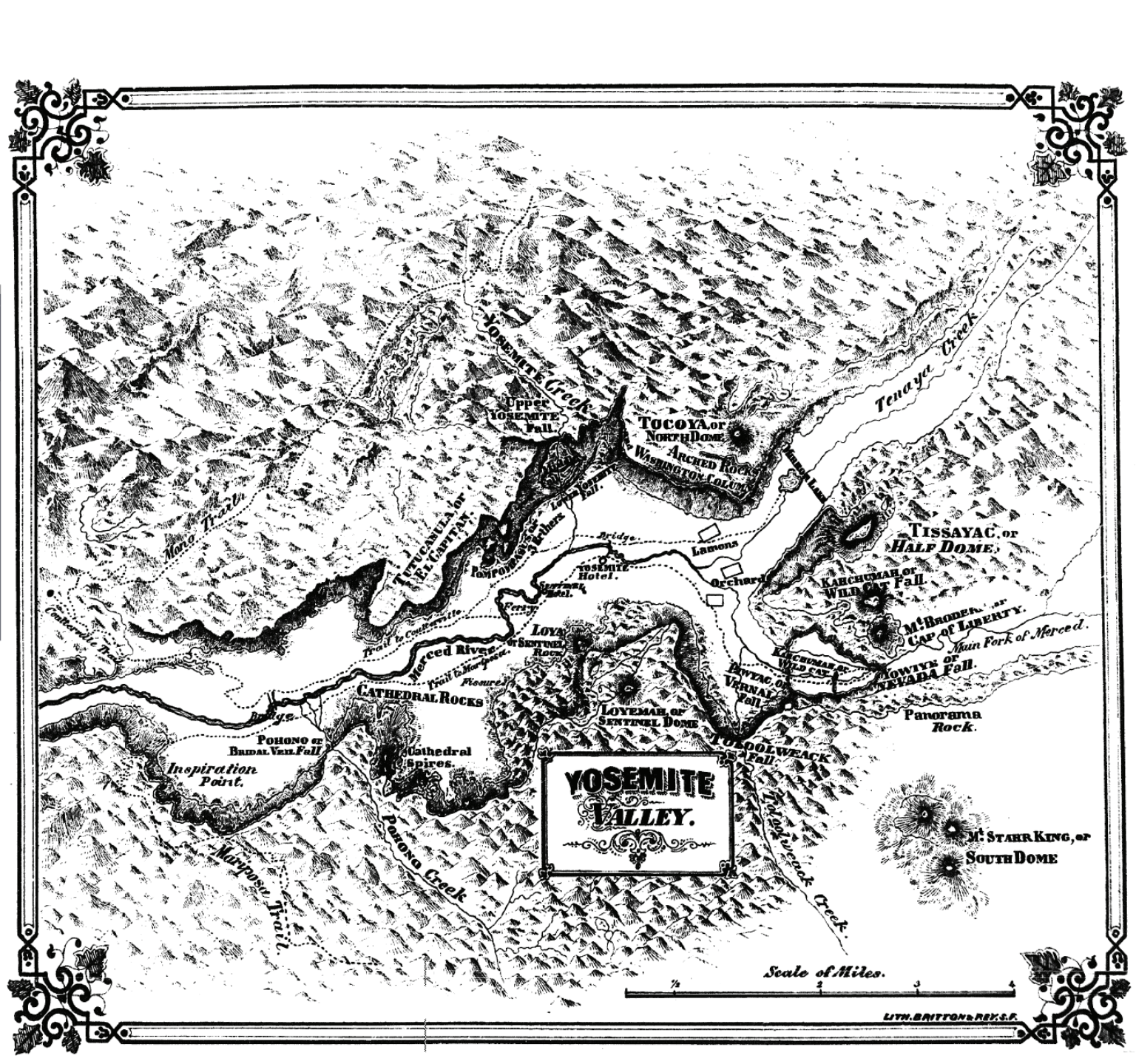


Figure 3:

Figure 4:




YOSEMITE VALLEY.
Yosemite Creek
Upper Yosemite Fall.
Tenaya Creek
Tocoya, or North Dome
Arched Rock
Washington Column
Indian Trail
Mono Trail
Tutucanula or El Capitan.
Lower Yosemite Fall.
Bridge
Lamons
Tissayac, or Half Dome.
Pompompasus Brothers
Yosemite Hotel.
Orchard
Karchuman or Wild Cat Fall.
Ferry
Trail to Coulterville
Loya or Sentinel Rock
Mt Broder, or Cap of Liberty.
Main Fork of Merced.
Merced River
Trail to Mariposa
Pleasure
Karchuman or Wild Cat
Mowtyn or Nevada Fall.
Cathedral Rocks
Loyemah, or Sentinel Dome
Panorama Rock.
Bridge
Pohono or Bridal Veil Fall
Cathedral Spires.
Inspiration Point.
Tis-sa-ack Fall.
Mt Starr King, or South Dome
Mariposa Trail
Pohono Creek
Tis-sa-ack Creek.
Scale of Miles.
½ 2 3 4
LITH. BRITTON & REY, S.F.

continues to increase, so will the number of people who make the transition to the outdoors.[7]

Managing Public Lands

The American Society of Landscape Architecture describes landscape architecture as involving "the planning, design, management, and nurturing of the built and natural environments."[10] The rise in climbing warrants the attention of this profession because it concerns the best management of the country's natural environments. The roles of landscape architects in our public lands is epitomized through the creation of our National Park System. Since its creation in 1916, a federal bureau has held the responsibility of maintaining and conserving "the nation's natural and cultural heritage for the benefit of current and future generations."[11] Enchanting stories of scenic beauty and transcendental experiences throughout the "wild" places of America have been embedded in the justification of conservation and preservation of these areas in the United States throughout history. We, as a country, find inherent and undeniable value in the iconic landscapes that comprise our 423 national park sites.[11]

Yosemite National Park is an excellent example of this. The first time the wellbeing of Yosemite Valley was threatened was in 1864.[12] At this time, President Abraham Lincoln signed a bill, the Yosemite Grant, to protect the area from humans, their animals, and the ensuing development of hotels and roads.[12] The park continued to receive an increasing number of visitors, especially once the Transcontinental Railroad was completed in 1869.[12] Around the same time, landscape architects such as Frederick Law Olmsted were involved in the development of national parks.[12] Their keen eye for design and ecology enabled them to understand the existing scenic characteristics of a park that should be preserved, revealed, and often, enhanced.[12] In 1865, Olmsted was appointed by the governor of California to the board of commissioners to oversee the Yosemite Grant.[13] After a family camping trip to the valley, Olmsted was overwhelmed by the beauty of Yosemite, writing, "the union of the deepest sublimity with the deepest beauty of nature, constitutes the Yosemite the greatest glory of nature."[14] Olmsted firmly believed that a democracy such as the United States had a political duty to share this beauty with all American citizens, not just the rich.[11] This idea of preserving the most special places across the country for all, not just the wealthy, was a radical and uniquely American idea.[13]

Olmsted's landscape park design skills and powerful beliefs in the effects of scenery on men [humans], were essential in the creation of Yosemite National Park.[13] Olmsted felt that the "framework of American picturesque culture

Figure 5: A map of the Yosemite Valley from 1868 by John S. Hittell.[17]

allowed him to conceive of Yosemite Valley as a landscape park: land that could be set aside and managed specifically for the preservation and appreciation of scenic qualities conductive of interpretation according to certain aesthetic values."[14] This clearly demonstrates the romanticized national park ideal held firmly within the American belief system. "Natural" places are meant to be kept pristine and managed to afford specific aesthetics.

By 1903, President Theodore Roosevelt invited a conservationist and naturalist by the name of John Muir to camp in the Sierras alongside him so he could "be alone with the trees and the man who found them sacred."[15] During this trip, John Muir, who had spent years studying and documenting Yosemite, was able to advocate for Yosemite and convince the President that it was time to designate it a national park.[15] By 1916, the Yosemite Valley had become just that.[13]

As of 2020, four million people visit Yosemite National Park each year.[16] The aesthetic qualities of the park are still revered and the landscape is managed to facilitate the active pursuit, through hiking, backpacking, canoeing, climbing, etc., of endless scenic views.

It is important to note that the creation of the National Park System is generally praised as "America's Best Idea" while the blatant erasure of entire peoples and cultures is conveniently excluded from the narrative.[15] However, that is a topic for deeper exploration in its own right. The creation, management and idealization of the national parks is presented here as a means of demonstrating the role landscape architects play in these spaces. Additionally, this is to recognize the continued national desire to preserve and protect these treasured landscapes for the enjoyment of all.

Vertical landscapes are an integral part of our national parks: 57% of outside climbing areas are located on federally managed lands[9] and approximately 25% of National Park Service units contain climbing opportunities.[18] With the growing number of people utilizing these vertical spaces, it is critical for landscape architects to recognize and integrate the management of these places with the existing management practices of our public lands. The most impactful way for landscape architects to approach the management of vertical spaces is by listening to and understanding the experience of rock climbers.

Yosemite National Park as a Case Study

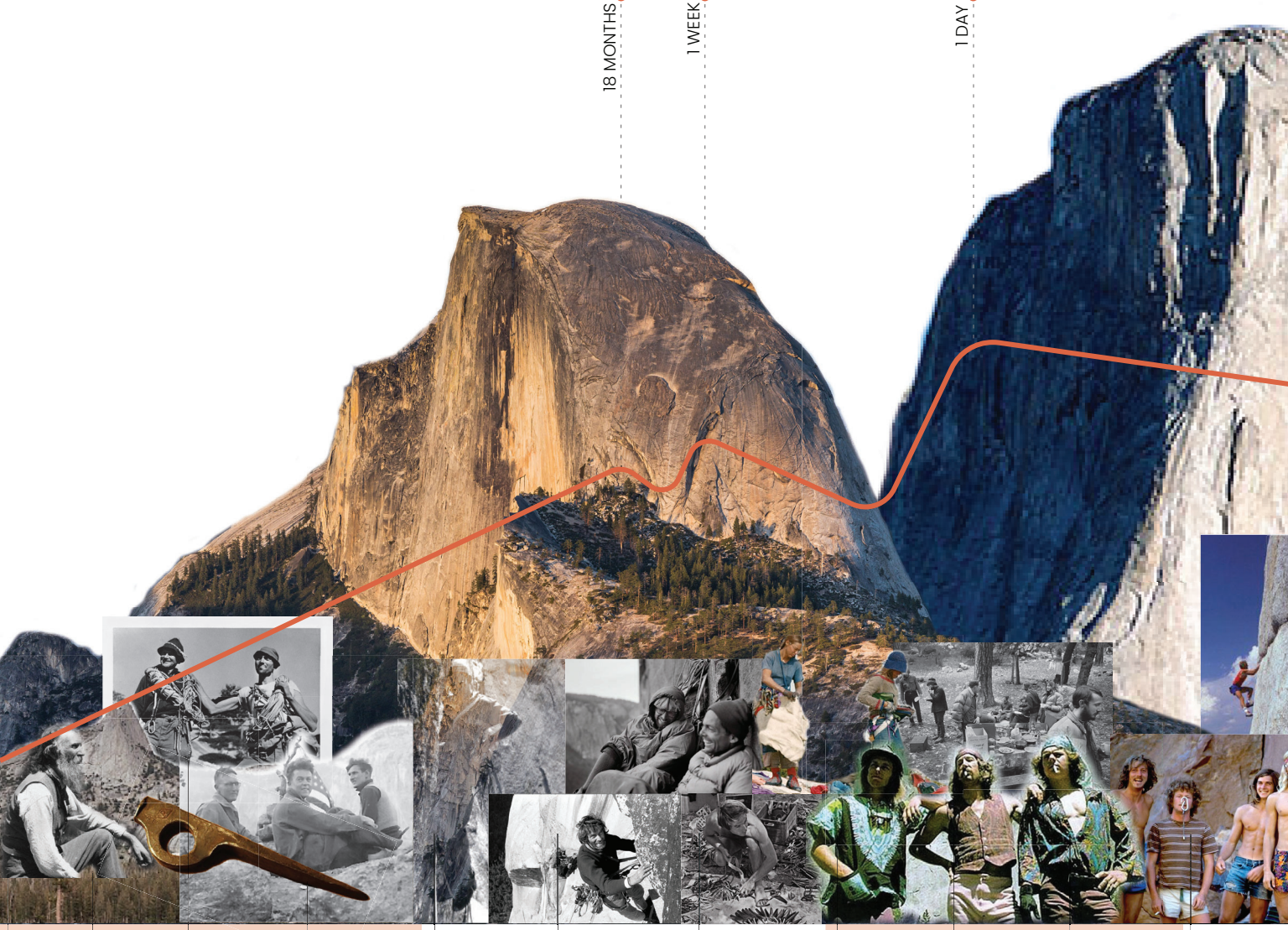
Yosemite National Park is also the birthplace, the mecca, the home of rock climbing.[19] It is here that climbers live on the granite rock walls that surround the glacier carved valley.[20] Most climbers regard Yosemite as the center of the universe[19] and some even feel it is the most sacred place in

THE RACE UP THE NOSE

18 MONTHS

1 WEEK

1 DAY



1869
John Muir climbs Cathedral Peak

1875
George Anderson summits Half Dome using hand drilled

1933
Climbers adopt Camp 4

1940s
John Salathe invents steel pitons and climbs SW face of Half Dome

1958
First ascent of the Nose on El Capitan by Warren Harding, Wayne Merry, George Whitemore, Rich Calderwood

1960
Royal Robbins climbs the Nose to beat Warren Harding

1970
Warren Harding makes first ascent of the Dawn Wall using bolts + Royal Robbins climbs same route chopping Warren's bolts down

1973
First all-female ascent of El Capitan by Sibylle Hechtel, Beverly Johnson

1975
Jim Bridwell, Billy Westbay, John Long climb the Nose in one day

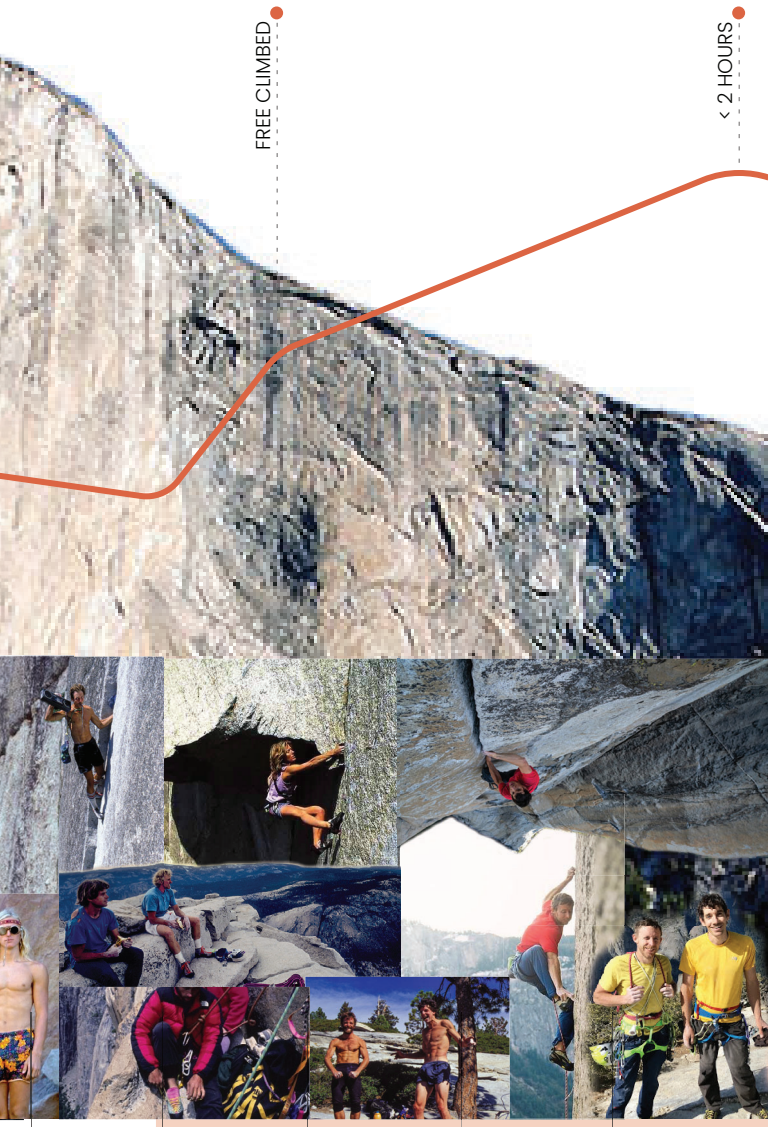
1975
First free ascent of Astroman by John Bachar, John Long, Ron Kauk

1986
John Bachar c
Peter Croft clir
Half Dome and
Capitan in one
day

Pre 1950s
THE PIONEERS

1955 - 1970
THE GOLDEN ERA

1973 - 1980
THE STONEMASTERS



the world.[21] The history and evolution of rock climbing is written on the valley walls.[19] Climbing in the 1800s was exclusively associated with exploration used for mapping and scientific purposes,[18] but in 1868 (twenty years after the gold rush brought a stampede of miners to the Sierra Nevada Mountains), John Muir made the first solo ascent of Cathedral Peak without a rope.[22] His feat marked a turning point in the field and made way for climbing as we know it today. This was the beginning of defining rock climbing as the ascent of steep rock formations[18] and the generation to start this pursuit would become known as the "Valley Pioneers."[22]

Less than ten years later, in 1875, George Anderson summited Half Dome using eyebolts, drilled hand and foot holds, and fixed ropes.[23] By the 1930s, Robert Underhill had brought the use of pitons (a peg or spike driven into a crack or rock to support a climber or rope), and the method of rappelling to Yosemite.[23] These pitons were imported from Europe and made of a soft iron metal.[23] These innovations allowed climbers to ascend steeper walls through the technique of aid climbing. Aid climbing relied on the equipment to hold a climber's body weight as they moved up the rock. Essentially, a climber would use a hammer to place a piton in the rock, attach a nylon ladder to it, climb the ladder, and repeat the process until

Figure 6: A timeline of landmark climbing events in Yosemite National Park.

they reached the top or the end of the day.[19] John Salathe, a blacksmith by trade, used his skills to create a better piton from the axle of an old Ford Model A.[23] This metal was harder, and better suited for the granite walls of Yosemite.[23] With this new technology, Salathe was able to establish the first big climbs in the valley including the southwest face of Half Dome.[23]

Armed with Salathe's pitons and an unbridled spirit of adventure, a new generation of climbers arrived in Yosemite in the 1950s. Following the end of the second World War, Americans across the country had fallen into a comfortable routine and predictable life: "get married, have kids, buy a dishwasher, and live out the American suburban dream."[19] In response, writers like Jack Kerouac led the beatnik movement in an effort to shake off conformity and push back against this safe, spiritless way of life.[19] Kerouac's writing resonated with young climbers of the time. At this time, rock climbing was still mainly seen as a practice for mountaineering with a conservative focus on safety and rules.[19] In opposition, these rebellious new climbers began climbing in tennis shoes, used ropes stolen from local telephone companies, and turned climbing into the ultimate adventure sport.[19] This era became known as the "Golden Age".[19]

These climbers brought a new perspective to rock climbing, transforming it into a way of life in the Yosemite Valley. In an interview, Yvon Chouinard, the founder of Patagonia and climber during the "Golden Age," said, "none of us expected to ever have a job. We were going to be hobos basically and we were gonna climb forever."[19] Glen Denny, another climber of the time, said, "Instead of making money, the idea was to reduce the overhead. It wasn't the way normal people lived."[19] Climbing during this time was an outlawed activity and this generation could not get enough of it.[19]

Climbers at this time were still using the technique of aid climbing and drew inspiration from Salathe's daring and creative climbing style.[19] With their counterculture attitude and brazen fearlessness, these climbers sought to climb the unthinkable. The first to do so was Royal Robbins. With his sights set on something taller and steeper than anything that had been climbed before, he set out to scale the northwest face of Half Dome with three other men.[19] The team followed a trail of cracks up the face, driving pitons into the wall along the way, and hauling their gear, food and water.[19] They spent nights tethered to the side of the wall, eventually reaching the summit on the fifth day.[23] This made Royal Robbins America's first climbing icon and set a new level of difficulty for the sport.[19] To challenge Robbins' reign, Warren Harding went for the one cliff in Yosemite that was even taller than Half Dome—El Capitan.[19] Climbing El Capitan was viewed as an

Figure 7: A map of Yosemite Valley highlighting key rock climbing areas.

Image Source: https://earth.google.com/web/search/El+Capitan,+California/@37.77402018,-119.52016642,2499.79272181a,46672.1970772d,30y,0h,0t,0r/data=CigiJgokCVGeaT3X7EJAEQe00yYm30JAGRUtxlbP1l3AIf4u-U1K5V3AMicKJQojCiExRWVvNzFzZ2tpOEZTeWlUSU04UmNVVXlIX054SXhMZGY

impossible feat, an act not even worth considering.[19] Harding tackled the challenge by climbing a route called the Nose on the edge of El Capitan. Climbing in an unconventional manner, hauling carts and hundreds of feet of rope, and fixing ropes to the wall to allow them to descend to the ground to rest or shuttle supplies up before climbing higher, Harding and his three other teammates were able to complete the climb in 18 months.[19] Shortly after, Royal Robbins responded by climbing the Nose without fixed ropes, but in a single push for the summit instead.[19] It took his team one week to reach the top of the climb.[19]

Two aspects of climbing in the Yosemite Valley came to light during this time. The competitive spirit of the sport was emerging, and the time it took for the best climbers to ascend the Nose became a marker of the advancements of the sport. The combination of these elements allowed this generation, and future ones, to push rock climbing to unforeseen limits.

Advancements in climbing gear also presented climbers with new horizons. During the 1960s and 1970s, removable climbing protection was created in the form of hexes, nuts, and, eventually, cams.[18] This resulted in phasing out the use of pitons, which damage the rock face.[18] The development of this new gear, now known as trad gear, helped inspire the next generation of climbers: "The Stonemasters."[22] These hippie athletes entered Yosemite hungry to set new rock climbing standards.[19] Through the use of trad gear and bolts drilled into blank faces of rock, this group was able to develop a new way of climbing.[18] They began climbing by only using the features on the rock that their hands and feet could hold onto. If they fell off, the rope would catch them. This is known as free climbing and it revolutionized the sport.[19] A higher level of athleticism and skill was now necessary to climb any wall. In 1975, Jim Bridwell climbed the iconic Nose route in a single day using the technique of aid climbing.[19] By 1993, Lynn Hill became the first person to free climb the Nose.[23]

In the mid-1980s, another climbing icon was making a name for himself—John Bachar. Bachar specialized in a totally new form of climbing known as free solo climbing. Free soloing is the most dangerous form of rock climbing in that no rope or gear is used. For Bachar, this was the true test of his skills, the ultimate mastery of climbing.[19] Not many other climbers were taking part in this form of the sport at the time. However, the next generation would follow Bachar's lead. This generation, which encompasses today's climbers, is known as "The Stone Monkeys," and is credited with keeping Yosemite on "the cutting edge of modern climbing."[19] Dean Potter was one of the first climbers to push the boundaries of free solo climbing in the late 1990s.[19] Alex Honnold grew up admiring Potter, and in 2008, he free solo

Figure 8: Tommy Caldwell and Kevin Jorgeson climbing the Dawn Wall.[25]

climbed Half Dome.[22] Alex Honnold "has taken free soloing to bigger and more difficult routes, taking what Bachar started to a whole new level."[19] However, this generation is not only focused on free soloing. Climbers like Tommy Caldwell have been creating some of the hardest new routes throughout the valley. In 2015, after a decade of work, Caldwell and his climbing partner Kevin Jorgenson climbed the Dawn Wall for the first time, a route that is seen as the hardest long free climb in the world.[23] It took them 19 days to complete.[22] Further, the speed record up the Nose on El Capitan has been broken numerous times by this generation. Currently, Alex Honnold and Tommy Caldwell hold the record with a time of 1:58:07.[24]

Over the past 60 years, Yosemite Valley has been witness to the unfathomable evolution of rock climbing. Each technical and technological advancement in the sport of rock climbing as a whole has occurred in this national park. The state of the art of climbing has long been measured by how fast climbers are able to summit the Nose.[19] Further, "that basic yearning for adventure remains the same [within the valley]—to step into the unknown and go beyond the possible'' despite greatly different generations of climbers leaving their unique mark.[19] Every climber is drawn to the walls of Yosemite, feels a sense of inspiration from these stories and the towering granite, and experiences a connection to this place through its rich history and culture. Yosemite National Park has remained an iconic and revolutionary rock climbing destination throughout history, and is still a coveted place today. Thus, Yosemite is the ideal location to ground this thesis. This national park will be utilized as a case study for the analysis of rock climbing aspects in later chapters.

Framework

A theoretical framework serves as a tool to compare how landscape architecture views verticality to that of rock climbers in order to identify lessons for the future of the field. This comparative method engages with existing landscape architecture literature in conjunction with rock climbers' interpretations of the vertical at Yosemite National Park. Using a case study to analyze the rock climbing experience allows for a more intimate and detailed account from which general conclusions can be made. Additionally, I visited Yosemite National Park to gain greater insights of this case study. While interviews at the park were not possible due to COVID-19 restrictions, personally experiencing the glory of the valley provided me with an immersive understanding. As a climber myself, I spent some time climbing in the park while taking in the scenic views. All roads except for the loop through the valley were closed due to weather conditions. This did not have a great impact on my experience however, and the locations of iconic rock climbing sites all remained accessible. My own observations and representations of the park are


DEFINING
VERTICAL SPACE
naming, definitions
RESULTING PRODUCED VERTICAL SPACE
LANDSCAPE ARCHITECTURE
analyzed through
literature review
ROCK CLIMBERS
analyzed through
case study +
site visit
ASSIGNING VALUE TO
VERTICAL SPACE
meaningful, appropriate
action
KNOWLEDGE ABOUT
VERTICAL SPACE
mapping, cataloging

woven into the presentation of Yosemite National Park as a case study.

The underlying theoretical framework used to place these two groups in conversation with one another draws from Libby Porter's characterization of the models Henri Lefebvre developed in his landmark *The Production of Space*. The core idea is that there are three mechanisms for the production of space. These mechanisms are interpreted as defining or ordering space, producing knowledge about space, and assigning value to space for active use.[26] Defining or ordering space results in the production of place through its definition and ordering, such as naming or defining boundaries.[26] The production of knowledge about space is realized through mapping and cataloging; and assigning value to space gives rise to appropriate, meaningful action and cultural expression.[26]

These three mechanisms are intertwined in the construction and codification of space.[26] Rock climbers present an alternative way of knowing and producing vertical space. This matters because "particular sensibilities about place... powerfully shape how places are ordered and defined, known, and thus acted on."[27] If landscape architects can discover the sensibilities that rock climbers hold regarding vertical landscapes, they can better act on the recognition and management of these places.

Libby Porter's interpretation of Lefebvre's three mechanisms define the outer circle shown in figure 9. These also represent the following three chapters of this thesis, and serve as a method for comparing the landscape architecture and rock climbing perspectives of verticality. Landscape architecture's understanding of vertical space is examined through literature review while the rock climbers' viewpoint is revealed through a case study of Yosemite National Park and personal experience. The diagram in figure 9 depicts no overlap between these two groups' interpretation of vertical space. However, the two will be brought together through the utilization of this framework.

Lefebvre's theory is appropriate in this case as a framework to explore and reveal the fundamental experiences, values and meanings of vertical places from a rock climbing perspective. This is a viewpoint and typology of vertical space distinctive from that of landscape architects. Therefore, it is fitting to apply this familiar theory in order to best relate landscape architecture and rock climbing constructions of vertical space.

Figure 9: Diagram representing the theoretical framework of this thesis.

Endnotes:
1. Daumal, Rene. *Mount Analogue*. New York, NY: The Overlook Press, 1972.

2. Booth, Norman K. *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*. Hoboken, NJ: Wiley, 2012.

3. Lam, Phoenix W., and David Graddol. "Conceptualising the Vertical Landscape: The Case of the International Finance Centre in the World's Most Vertical City." *Journal of Sociolinguistics* 21, no. 4 (September 11, 2017): 521–46. https://doi.org/10.1111/josl.12243.

4. Lam, Phoenix W., and David Graddol. "Conceptualising the Vertical Landscape: The Case of the International Finance Centre in the World's Most Vertical City." *Journal of Sociolinguistics* 21, no. 4 (September 11, 2017): 522. https://doi.org/10.1111/josl.12243.

5. Dee, Catherine. "'The Imaginary Texture of the Real ...' Critical Visual Studies in Landscape Architecture: Contexts, Foundations and Approaches." *Landscape Research* 29, no. 1 (2004): 13–30. https://doi.org/10.1080/0142639032000172424.

6. Dee, Catherine. "'The Imaginary Texture of the Real ...' Critical Visual Studies in Landscape Architecture: Contexts, Foundations and Approaches." *Landscape Research* 29, no. 1 (2004): 24. https://doi.org/10.1080/0142639032000172424.

7. Kuelthau, Willis. "The Statistics Behind the Growth of Rock Climbing & Bouldering." 99Boulders, June 28, 2019. https://www.99boulders.com/the-growth-of-climbing.

8. Wilkinson, Freddie. "Rock Climbing: from Ancient Practice to Olympic Sport." *National Geographic*, March 14, 2019. https://www.nationalgeographic.com/adventure/article/rock-climbing.

9. SGB, Media. "American Alpine Club Report Reveals Climbing's Powerful Impact." SGB Media Online, July 11, 2019. https://sgbonline.com/study-reveals-climbings-powerful-impact/.

10. ASLA. "About: What Is Landscape Architecture?" American Society of Landscape Architects. Accessed April 20, 2021. https://www.asla.org/aboutlandscapearchitecture.aspx.

11. "National Park System." National Parks Service. U.S. Department of the Interior. Accessed April 21, 2021. https://www.nps.gov/aboutus/national-park-system.htm.

12. Spence, Mark. "Dispossesing the Wilderness: Yosemite Indians and the National Park Ideal, 1864-1930." *Pacific Historical Review* 65, no. 1 (January 1996): 27–59. https://doi.org/10.2307/3640826.

13. Carr, Ethan. *Wilderness by Design: Landscape Architecture and the National Park Service*. Lincoln, Nebraska: University of Nebraska Press, 1999.

14. Carr, Ethan. *Wilderness by Design: Landscape Architecture and the National Park Service*. Lincoln, Nebraska: University of Nebraska Press, 1999. 27.

15. Watch The National Parks: America's Best Idea. PBS. Public Broadcasting Service, 2009. https://www.pbs.org/kenburns/the-national-parks/#645.

16. "The History of Yosemite National Park." National Park Reservations, 2003. https://www.nationalparkreservations.com/article/yosemite-the-history-of-yosemite-national-park/.

17. Hittell, John S. *Yosemite; Its Wonders and Its Beauties*. San Francisco, CA: H.H. Bancroft & Co., 1868.

18. "NPS Climbing History." National Parks Service. U.S. Department of the Interior, June 1, 2020. https://www.nps.gov/subjects/climbing/history.htm.

19. Valley Uprising. Amazon Prime Video. United States: Sender Films, 2014. https://www.amazon.com/Valley-Uprising-Peter-Sarsgaard/dp/B01M3UPOWI/.

20. Collins, Jeremy. *Drawn: the Art of Ascent*. Seattle, WA: Mountaineers Books, 2015.

21. Frohlich, Robert. "Kauk Loosens His Cape." Adventure Sports Journal, September 1, 2010. https://adventuresportsjournal.com/kauk-loosens-his-cape/.

22. Editors, The. "The 25 Greatest Moments in Yosemite Climbing History." Outside Online, June 1, 2016. https://www.outsideonline.com/2075501/25-greatest-moments-yosemite-climbing-history.

23. "Yosemite Climbing History." Touchstone Climbing, October 7, 2014. https://touchstoneclimbing.com/yosemite-climbing-history/.

24. Planetmountain. "Alex Honnold, Tommy Caldwell and the El Capitan Nose Speed Record Time-Lapse." PlanetMountain.com, May 7, 2020. https://www.planetmountain.com/en/news/climbing/alex-honnold-tommy-caldwell-el-capitan-nose-speed-record-time-lapse.html#:~:text=In%20June%202018%20American%20rock,into%20just%20over%20two%20minutes.

25. Armand, Agathe. "Climbing Duo on Dawn Wall Success and the Power of Pep Talks." Red Bull. Red Bull, April 10, 2018. https://www.redbull.com/us-en/dawn-wall-interview.

26. Porter, Libby. "Producing Forests: A Colonial Genealogy of Environmental Planning in Victoria, Australia." *Journal of Planning Education and Research* 26, no. 4 (2007): 466–77. https://doi.org/10.1177/0739456x07301170.

27. Porter, Libby. "Producing Forests: A Colonial Genealogy of Environmental Planning in Victoria, Australia." *Journal of Planning Education and Research* 26, no. 4 (2007): 474. https://doi.org/10.1177/0739456x07301170.

Graphical Data:
Figure 2: Gyms and Trends report, Climbing Business Journal

Figure 3: Industry Report, Climbing Wall Association

Figure 4: Outdoor Participation Report, Outdoor Foundation

3 DEFINING THE VERTICAL

This chapter employs Lefebvre's definition of space to understand how landscape architects and rock climbers define vertical space. This can take the form of literal definitions and naming practices to distinctly define what the vertical space is.

Definitions Used by Landscape Architects

Within the field of landscape architecture, verticality is primarily defined as a fundamental design tool. Vertical elements are used in order to facilitate the framing of views, assist in creating a sense of enclosure, work to integrate space and form, or provide privacy.[1] They are further utilized to filter or screen sun and wind, provide backgrounds or accents, and create structural support for an overhead plane.[1] Vertical components can take the form of walls, fences, planting material, topography and landforms, or, as Norman Booth states in his book *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*, "anything else that extends upward from the ground plane."[2] These pieces are characterized by a wide range of qualities

from height, solidity and texture to color, materiality and purpose.

In her book *Form and Fabric in Landscape Architecture: a Visual Introduction*, Catherine Dee describes how engaging these vertical, or wall, planes in tandem with the ground and "sky" planes enables designers to best manipulate space, particularly within urban environments.[3] In this definition, it is recognized that vertical planes within most landscape settings are disconnected from the vertical planes of the built environment such as buildings, and they possess a complexity and textural quality.[3] This complexity allows for the, oftentimes subtle, merging of horizontal and vertical planes found within landscapes.[3] This results in an ambiguous fluidity between dimensions, and can impede the identification and definition of specific vertical elements.

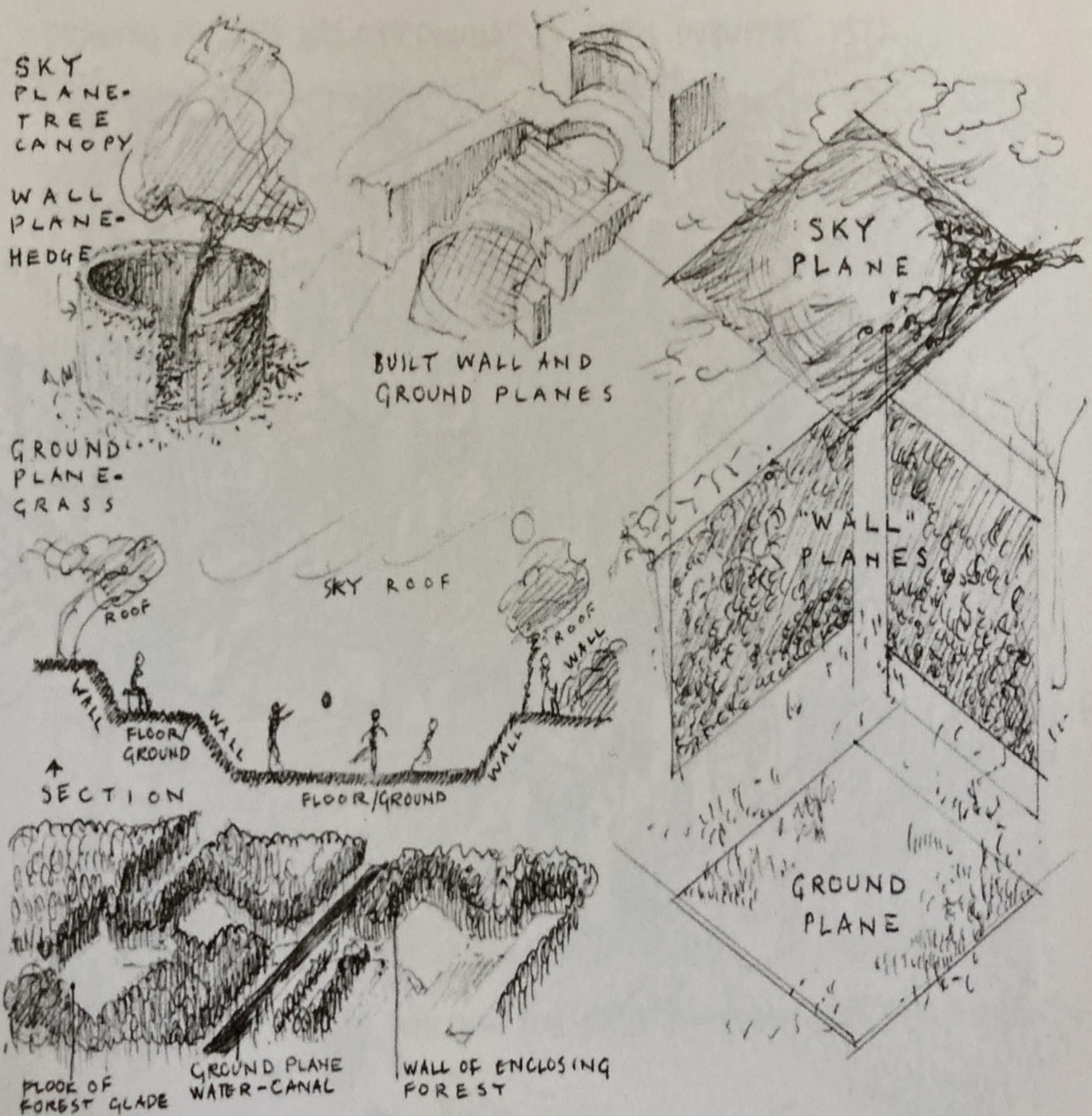
In other cases, the vertical is defined simply as an edge. In Catherine Dee's book, *Form and Fabric in Landscape Architecture: A Visual Introduction*, she states that "wall planes can be places in their own right" but defers this view to the definition of an edge.[4] Again, Norman Booth in his book *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*, primarily regards vertical planes as the defining edge of a space.[1] These vertical edges are seen as space dividers, screens, or backdrops and are mainly used to delineate between spaces, activities and uses or to enclose a place to varying degrees.[1]

Overall, verticality within landscape architecture is defined as a vital tool. Designers are well versed in the vertical plane as it relates to vegetation layers, defining space, creating and directing views, manipulating topography, and producing edge conditions. While this definition of vertical space is fundamental to the practice of landscape architecture, it is also narrow. Utilizing vertical dimensions in these ways is inherent and assumed in the field of landscape architecture while other definitions of vertical space are not widely studied or considered.

Definitions Used by Rock Climbers

Rock climbers define the vertical as an inhabitable space, a space to be explored, the ultimate playground.[5] As Royal Robbins, a pioneer in the Yosemite rock climbing scene, once said, rock climbers are "pilgrims of the vertical."[6] Their sole purpose is to ascend vertical faces by interacting with the rock in intimate, detail oriented ways. This act of defying gravity is inherently defined by risk. Risk is a double-edged element of the sport as it is a "precondition for demonstrating nerve and virility."[7] While the sport itself is defined by danger, as is thus the vertical faces climbers explore, this element also works in turn to define the character of the climber. In Joseph Taylor's book, *Pilgrims of*

Figure 10: Catherine Dee's sketches depicting the vertical, or wall, plane.[3]


SKY PLANE- TREE CANOPY
WALL PLANE- HEDGE
GROUND PLANE- GRASS
BUILT WALL AND GROUND PLANES
SKY PLANE
"WALL" PLANES
GROUND PLANE
SKY ROOF
ROOF
ROOF
WALL
WALL
WALL
WALL
FLOOR/ GROUND
FLOOR/GROUND
SECTION
FLOOR OF FOREST GLADE
GROUND PLANE WATER-CANAL
WALL OF ENCLOSING FOREST

CLIMBING TERMS

CLIMBING GEAR

Belay device |
A mechanism used by a belayer that 'catches' a climber when they fall. The device locks the rope in place and prevents the climber from falling a significant distance.

Camming device |
A piece of equipment placed on a trad climbing route to protect the climber from falling far. It wedges into a pocket or crack by rotating.

Nut |
A small piece of metal that is wedge-shaped and attached to the end of a wire. Used to jam in cracks as a piece of protection on a trad route.

Quickdraw |
Two non-locking carabiners joined together by a length of reinforced webbing. Used to attach a rope to a bolt or piece of protection.

Rack |
A collection of climbing gear needed to climb a route. This can include quickdraws, carabiners, nuts and camming devices.

CLIMBING STYLES

Crag |
The name used for an outdoor climbing area or the cliff/rock in which climbing can be done.

Crimp |
The name given to a very small or thin climbing hold.

Edging |
A technique used to place weight on very small or thin footholds. The climber uses the edges of their feet instead of the soles.

Fist jam |
A technique used when crack climbing where the crack is wide enough for a whole fist to be placed in it and used for stability or for upward movement.

CLIMBING TECHNIQUES

Anchor |
A point on a climb where the rope is attached to the rock. It is usually at the top of the route, and can be chains, bolts, ropes, or slings.

Belay |
A method of controlling the climbing rope that is used to prevent a climber from falling to the ground should they come off the rock.

Bolted route |
A sport climbing route that is protected with pre-placed bolts that are secured into the wall and act as anchors. Quickdraws are clipped onto the bolts and the climbing rope is clipped onto the quickdraws to provide protection for the climber.

Lead climbing |
The first person to ascend a route is the lead climber and does so by placing their own gear as they climb up a route or by clipping onto pre-placed bolts as they climb.

CLIMBING CONVERSATION

Beta |
Information about a climb or a route that is shared either verbally or in guide books.

Crux |
The most technically difficult section of a climb.

On-sight |
When a climber ascends a route cleanly from start to finish on their very first attempt, without falling and with no prior knowledge of how to ascend the climb successfully.

Pitch |
A route that can be climbed using the length of one climbing rope.

Send |
When a climber ascends a route cleanly from start to finish without falling or resting on any placed gear or ropes.

the Vertical: Yosemite Rock Climbers and Nature at Risk, John Ruskin is quoted as saying, ". . . if you come to a dangerous place, and turn back from it, though it may have been perfectly right and wise to do, still your *character* has suffered some slight, deterioration; you are to that extent weaker, more lifeless, more effeminate, more liable to passion and error in future; whereas if you go through with the danger though it may have been apparently wrong and foolish to encounter it, you come out of the encounter a stronger and better man, fitter for every sort of work and trial, and *nothing but danger* produces this effect."[7] In general, facing the undeniable fear that comes with this risk and finishing a climb is a form of conquering the vertical. In this sense, rock climbers define vertical spaces as places to test their physical and mental strength, and, ultimately, assert dominance over gravity and the features of the rock.

Rock climbers also use climbing-specific jargon as a way of defining vertical.[8] This jargon constructs a language unique to the sport. While it can be exclusionary to outsiders of the rock climbing sphere, it builds a social identity and allows climbers to better articulate, or define, the vertical space, their bodily movements, styles of climbing, and gear and techniques used.[8] Climbing jargon, like other forms of professional jargon, also enables climbers to more efficiently and effectively communicate with one another. Essentially, these terms are used to name types of rock climbing, understand specific aspects of the rock face, and exchange knowledge of the vertical and experiences on the vertical with other climbers. Naming the type of rock climbing taking place also infers information about the vertical. For example, "trad climbing" describes a type of climbing that requires the presence of naturally occurring cracks and pockets on the rock for the placement of protection gear by the climber as they ascend.[9] This term also provides specific information about the rock face itself. Not only does it reveal the feature of a crack in the face of the rock, it also defines the width and nature of the crack as there is a limited size range of protective gear climbers will use for this type of climbing. In another instance, a climber may use the term "crimp" to represent a very small or thin climbing hold.[9] This indicates a fairly smooth textural quality to the rock in that particular area, with minor undulations or edges just big enough to be used by the tips of the fingers. Another word that divulges critical information is the word "pitch." A "pitch" is a route on the wall that can be climbed using the length of a single climbing rope.[9] From this term, climbers can extrapolate the presumed height of a vertical face. A climbing rope is typically 60 to 70 meters long and thus a pitch can be no taller than 30 to 35 meters tall if one rope is to be used.

Figure 11: List of selected climbing terms demonstrating how rock climbers use language to define vertical space.[9]

Another language is used to define the difficulty of a route. The Yosemite Decimal System (YDS) is used in the United States to rate each climb.[10] Other countries use distinctly different systems, similar to the difference between the United States and metric measuring systems.[10] The Yosemite Decimal System was originally developed to describe a full range of backcountry travel.[10] This begins with route classifications where Class 1 is defined as an established flat, easy trail up to Class 5 in which the climbing becomes technical and a rope is required.[10] This class system is then broken down into sub-categories. A 5.1 to 5.4 rating means the climb has large handholds and footholds and is suitable for beginners.[10] As the holds get smaller, the terrain gets steeper, or even overhanging, and more technical skills are required, the ratings increasingly get higher.[10] A 5.11 to 5.12 rating is given to a technical, vertical climb with small holds that may be achievable for dedicated climbers with much practice.[10] A 5.13 to 5.15 climb sits at the hardest end of the scale and involves strenuous climbing. These routes are climbed by experts or professional climbers who put in an exorbitant amount of training and possess a natural ability.[10] A sub classification system of letters (a, b, c, or d) is then applied to the ratings of 5.10 and higher in order to further define a route's difficulty.[10] This means that a route with a rating of 5.11a is easier than one rated at 5.11d. The most difficult part of a climb, or the "crux," is used as the basis for the rating of the overall route.[10] Finally, a rating of 6.0 means that the route cannot be free climbed due to the lack of handholds and footholds and must be aid-climbed.[10] Additional information regarding the terrain of a climb can be gleaned from it's grade. "Climbing grades provide guidance, suggesting the length of time an experienced climber might take to complete the route."[10] A grade I route would generally take a couple of hours while a grade VI route would take more than two days.[10] Overall, this language defines specific features of the vertical that can be translated to any rock face and provides a detailed understanding of the vertical landscape.

In order for there to be a climb for rock climbers to talk about, someone must first establish the route. This is especially important for sport, or bolted, climbing routes where bolts up the face of the rock are required. Defining a new climbing route is a laborious, time consuming and intensive undertaking. Route developers are usually experienced climbers who have gained invaluable knowledge regarding what constitutes a good route.[11] It is their duty to ensure their route is as safe and enjoyable as possible.[12] This process begins with a vision—a route setter must first look at a blank vertical face and envision a potential line to the summit.[11] Next, it is imperative for the route developer to check with local land managers, climbing organizations, and the

Figure 12: Charts depicting the rating system used to define the difficulty of a climbing route.[10]

Route Classifications		
Class 1		Walking an established flat, easy trail.
Class 2		Hiking a steep incline, scrambling, maybe using your hands.
Class 3		Climbing a steep hillside, moderate exposure, a rope may be carried but not used, and hands are used in climbing. A short fall could be possible.
Class 4		It is steeper yet, exposed and most people use a rope due to the potential of long falls.
Class 5		Climbing is technical and belayed roping with protection is required. It is not for a novice. Any fall from a Class 5 could be fatal.
Class 5 sub-categories		
5.1-5.4	Easy	A steep section that has large handholds and footholds. Suitable for beginners.
5.5-5.8	Intermediate	Small footholds and handholds. Low-angle to vertical terrain. Beginner to intermediate rock climbing skills required.
5.9-5.10	Hard	Technical and/or vertical, and may have overhangs. These hard climbs require specific climbing skills that most weekend climbers can attain.
5.11-5.12	Hard to Difficult	Technical and vertical, and may have overhangs with small holds. Dedicated climbers may reach this level with lots of practice.
5.13-5.15	Very Difficult	Strenuous climbing that's technical and vertical, and may have overhangs with small holds. These routes are for expert climbers who train regularly and have lots of natural ability.
6.0	Can't be free climbed	Devoid of hand- and footholds, the route can only be aid-climbed. An added rating of A1 through A5 further designates difficulty level.


2,500 feet above valley
2,000 ft
Wino Tower
Size of a person
1,500 ft
Pitch 15
Crux Dyno
Base camp
1,000 ft

Access Fund—a not-for-profit rock climbing advocacy group[13]—regarding the specific regulations related to putting up new routes in the area.[11] Many climbing areas within the United States Bureau of Land Management and Forest Service lands do not have specific guidelines or laws around bolting practices.[11] However, this can vary depending on the area. From here, a route developer will hike to the top of the cliff whose vertical face contains their envisioned route.[11] Sometimes this hiking can be treacherous, involving third-class climbing or uncertain moves while carrying all of the essential gear.[11] This gear includes a cordless hammer drill, wall hammer, bolts, hangers, wrenches, and more.[11] Once arriving at the top and hopefully identifying the route they had scoped out from below, the climber will set up an anchor, throw the strands of a rope down, and lower onto their potential line.[11] Now begins the cleaning process. This process includes the removal of greenery and loose rock from the route as even a thin layer of lichen or dust can overcome the friction between a climber's shoe and the wall.[12] Additionally, it is important to ensure there is a suitable platform on the ground below the climb for future belayers—who will catch their climbing partner should they fall off the route—to stand.[12] Once the route has been cleaned, the developer will figure out the sequencing of moves—the best way to climb the route—and place the bolts.[11] A good bolt placement is in solid rock that is not hollow behind, directs the climbing rope away from sharp edges, clearly directs the climber up the intended route, and best protects the climber from a dangerous fall.[12] Stainless steel hardware is used for bolts and all other associated pieces, including washers, nuts, and hangers, to guarantee safety and longevity of the gear.[12] It is best to avoid using gear whose individual pieces are made from different metals as this results in a chemical reaction that promotes rapid galvanic corrosion.[12] Route developers are also responsible for purchasing the necessary hardware.[11] Once the route developer has successfully completed the climb themselves, it is opened to the public for everyone's enjoyment.[11] Climbing routes also need to be maintained as bolts or anchors get rusty, loose, or otherwise damaged. Replacing these pieces is the collective responsibility of the climbing community.

A good climbing route will utilize the natural features of the rock and accept the challenge that the terrain presents while establishing an independent line that is distinct from nearby routes.[11] Route setting is the process of expanding rock climbers' definition of the vertical. As more routes are set, and more climbs are defined, the vertical landscape from a climber's perspective grows. New climbing routes offer new opportunities for these vertical spaces to be defined.

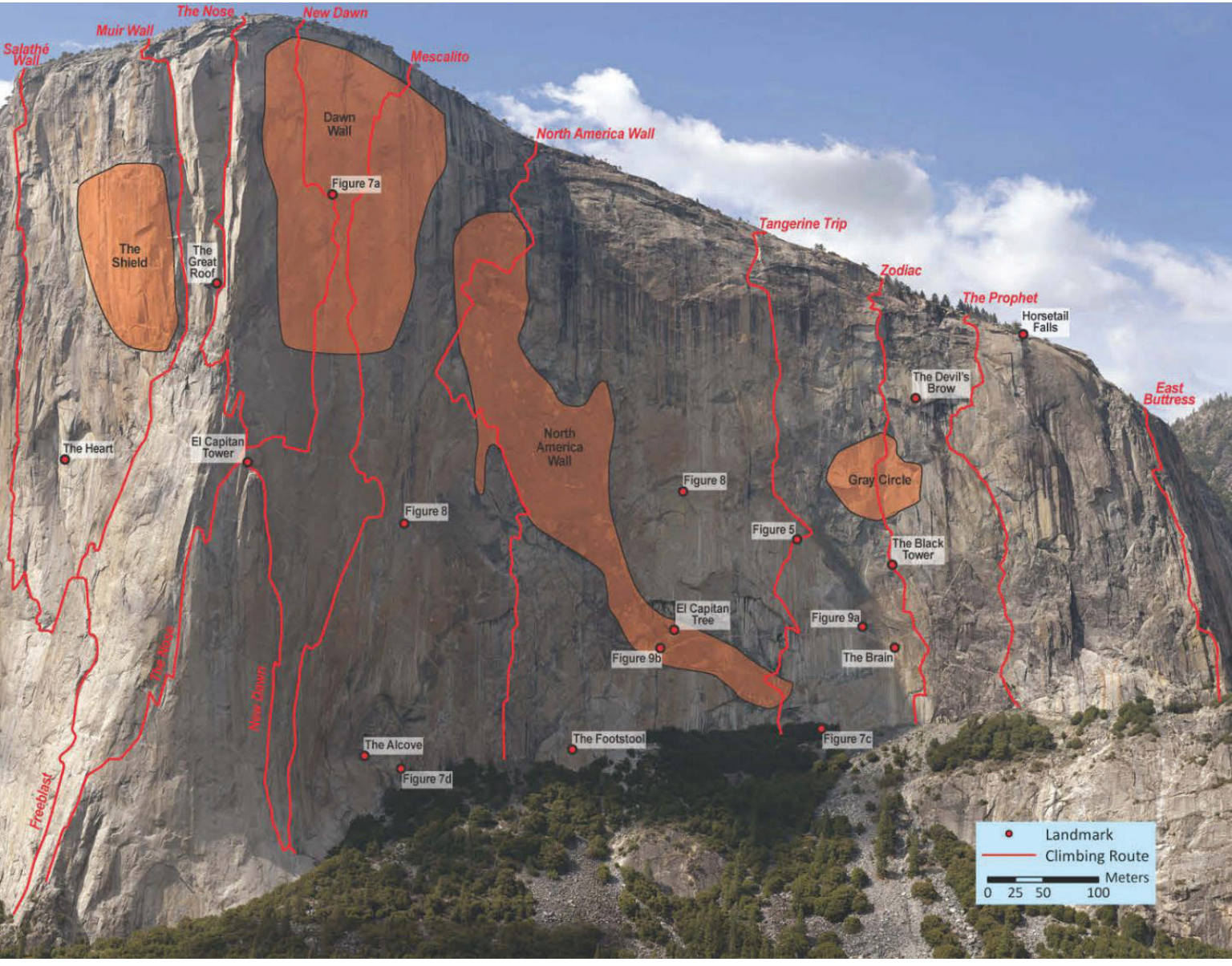
Figure 13: Illustration of Tommy Caldwell's new route up the face of the Dawn Wall in Yosemite National Park.[15]

This process of defining new routes is well illustrated by Tommy Caldwell's establishment of the first climb on the Dawn Wall in Yosemite National Park. Over the course of a decade, Caldwell scaled the Dawn Wall thousands of times, working to discover which lines up the face were climbable.[14] Caldwell and his partner, Kevin Jorgeson, would painstakingly put together the moves of a section here and there, and eventually found ways to connect each of these individual sections to create one cohesive climb.[14] These efforts culminated in a new face of the Dawn Wall becoming defined as climbable, a feat long thought impossible until Caldwell and Jorgeson's accomplishment of the route in 2015.[15] Endeavors such as this continue to push the boundaries of climbing and redefine what is possible.

The naming of each new route, wall, and climbing area is another way rock climbers define the vertical. The name of any given crag—otherwise known as climbing area—is based off what most climbers call that place or an official name, such as a state park.[16] Climbing routes are traditionally named on a first-come basis.[16] The person who discovers or first summits the climb earns the privilege of choosing its moniker.[17] Developing a new climbing route is a labor of love oftentimes taken on by an individual and done so with little oversight.[17] Therefore, route developers view naming their piece of the rock as a reward.[17] Once established, route names are passed down "by word of mouth and immortalized in climbing route guidebooks."[17] For example, the Nose on El Capitan received this name simply because it resembles the profile of a nose.[18] The Salathe Wall, also on El Capitan, was named by Yvon Chouinard, a legendary Yosemite climber and founder of Patagonia, in honor of John Salathe who was a pioneer of rock climbing in the valley.

More recently, there has been a reckoning of disrespectful or offensive route names that exist in climbing areas across the country. This type of route name includes racist or sexist terms and serves to cause harm. Some climbers, rightfully so, feel alienated, unwelcome and/or uncomfortable in these areas. This experience is slowly becoming more recognized and movements to change such route names have gone into effect. Further, climbing communities are beginning to acknowledge the fact that naming routes as a result of being the first to conquer a natural feature is a colonialist practice. Climbing areas are positioned on lands that have long been occupied—much longer than rock climbing has existed—by other peoples. These communities have their own claims to those rocks, their own names and uses for those spaces, and their own ways of describing those lands. The recognition of this within the climbing world has begun and there are efforts to better understand and honor this.

Figure 14: Notable locations and climbing routes on the southeast face of El Capitan in Yosemite National Park.[19]


The Nose
New Dawn
Muir Wall
Salathé Wall
Mescalito
Dawn Wall
North America Wall
Figure 7a
The Shield
The Great Roof
Tangerine Trip
Zodiac
The Prophet
Horsetail Falls
The Devil's Brow
East Buttress
The Heart
El Capitan Tower
North America Wall
Figure 8
Gray Circle
Figure 8
Figure 5
The Black Tower
El Capitan Tree
Figure 9a
Figure 9b
The Brain
The Nose
New Dawn
The Alcove
The Footstool
Figure 7c
Figure 7d
Freeblast
Landmark
Climbing Route
Meters
0 25 50 100

This side to the names of routes deserves more attention and thorough research, however addressing these issues fully is outside the scope of this project. It is important to understand the process and intent behind the naming of rock climbing routes as it is a central practice in how climbers define vertical space. Each route has a unique name such that there is rarely much overlap, allowing each route to be distinctly defined as its own expression of vertical space.

Conclusions

Overall, the ways in which landscape architects define the vertical are distinctly different from the ways rock climbers do so. Landscape architects interpret vertical space as a design tool and critical element in the division, enclosure, and screening of space and views. This definition of vertical presents it as a feature with aesthetic qualities and does not consider vertical space as inhabitable. Rock climbers, on the other hand, define the vertical as space to occupy. Climbers develop climbing routes to define specific lines up vertical faces, name each of these routes to further define the space and use their own terminology to communicate features of the vertical.

Figure 15: A climbing rope hangs along the line of a route named Secret Agent Dward in Yosemite Valley.

Endnotes:

1. Booth, Norman K. *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design.* Hoboken, NJ: Wiley, 2012.

2. Booth, Norman K. *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design.* Hoboken, NJ: Wiley, 2012. 33.

3. Dee, Catherine. *Form and Fabric in Landscape Architecture: a Visual Introduction.* New York, NY: Routledge, 2013.

4. Dee, Catherine. *Form and Fabric in Landscape Architecture: a Visual Introduction.* New York, NY: Routledge, 2013. 45.

5. "Rock Climbing." National Parks Service. U.S. Department of the Interior. Accessed April 23, 2021. https://www.nps.gov/yose/planyourvisit/climbing.htm.

6. Joseph III, Taylor E., and Joseph E. Taylor. *Pilgrims of the Vertical Yosemite Rock Climbers and Nature at Risk.* Cambridge, MA: Harvard University Press, 2011.

7. Joseph III, Taylor E., and Joseph E. Taylor. *Pilgrims of the Vertical Yosemite Rock Climbers and Nature at Risk.* Cambridge, MA: Harvard University Press, 2011. 23.

8. Rickly, Jillian M. "Cultural Geographies." Essay. In Cultural Geographies 24, 24:69–85. 1. London, UK: SAGE, 2017.

9. Holmes, Joey. "63 Useful Rock Climbing Terms Every Climber Should Know." Cool of the Wild. Accessed April 23, 2021. https://coolofthewild.com/rock-climbing-terms/.

10. Parks, Jay. "Climbing and Bouldering Rating Systems." REI Co-op. Accessed April 23, 2021. https://www.rei.com/learn/expert-advice/climbing-bouldering-rating.html.

11. Sbarra, BJ. "What It Takes To Develop A New Climbing Route." REI Co-op Journal, May 22, 2020. https://www.rei.com/blog/climb/what-it-takes-to-develop-a-new-climbing-route.

12. "Route Building 101: A How-To Guide." TAWKROC. Accessed April 23, 2021. https://tawkroc.org/bolting-reimbursement/route-building-101/.

13. "The Climber's Pact." Access Fund. Accessed April 14, 2021. https://www.accessfund.org/learn/the-climbers-pact.

14. The Dawn Wall. Amazon Prime Video, 2017. https://www.amazon.com/Dawn-Wall-Tommy-Caldwell/dp/B07K6ZG7P2/ref=sr_1_1?crid=2O5940OKTBKCH&dchild=1&keywords=the+dawn+wall&qid=1619220050&s=instant-video&sprefix=the+dawn+wall%2Caps%2C255&sr=1-1.

15. Carter, Shan, Wilson Andrews, Derek Watkins, and Joe Ward. "The Dawn Wall: El Capitan's Most Unwelcoming Route." The New York Times. The New York Times, January 10, 2015. https://www.nytimes.com/interactive/2015/01/09/sports/the-dawn-wall-el-capitan.html.

16. "Naming Conventions." the Crag. Accessed April 24, 2021. https://www.thecrag.com/en/article/namingpolicy.

17. Kandula, Ikya. "Climbers Are Pushing Back on How Racist Climbing Routes Are Named." Condé Nast Traveler. Condé Nast Traveler, August 17, 2020. https://www.cntraveler.com/story/climbers-are-pushing-back-on-how-racist-climbing-routes-are-named.

18. Valley Uprising. Amazon Prime Video. United States: Sender Films, 2014. https://www.amazon.com/Valley-Uprising-Peter-Sarsgaard/dp/B01M3UPOW/ref=sr_1_1?crid=26EQET27ODTN1&dchild=1&keywords=valley+uprising&qid=1619025572&sprefix=valley+uprising%2Caps%2C304&sr=8-1.

19. "Meeting Face-to-Face with El Capitan (Yosemite National Park, USA)." EurekAlert! Geological Society of America, July 23, 2015. https://www.eurekalert.org/pub_releases/2015-07/gsoa-mfw072315.php.

4 KNOWING THE VERTICAL

This chapter looks at the second aspect of Lefebvre's theory, the production of knowledge about space. This can be realized through mapping, cataloging, or other means of representing knowledge about vertical space.

Production of Knowledge by Landscape Architects

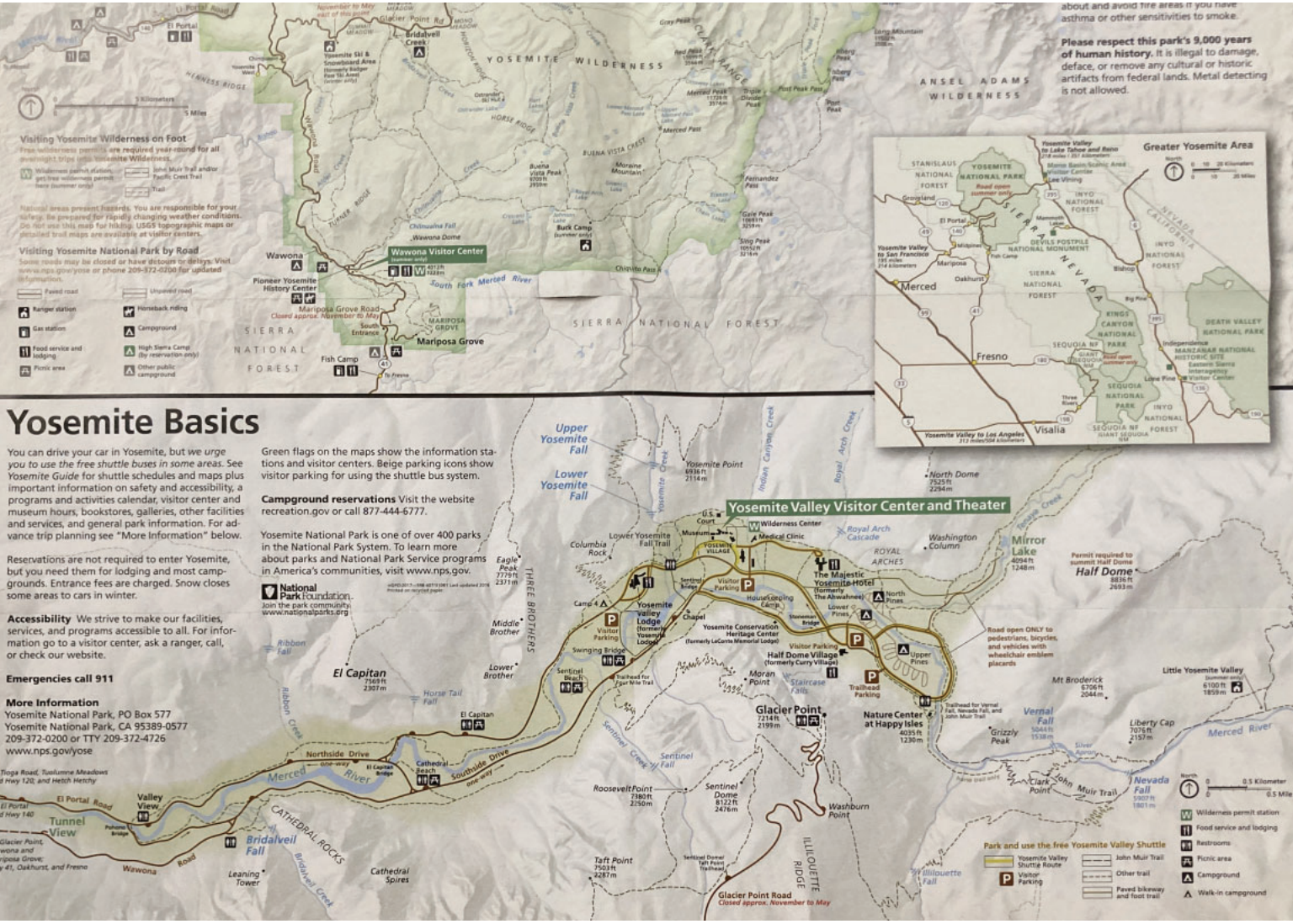
Landscape architects are well versed in various methods of graphically representing knowledge about vertical space. One of these basic skills with regard to landform is the use of contour lines and topographic maps. Contour drawings represent the form of vertical space by essentially flattening it. In the book *Site Engineering for Landscape Architects*, the authors describe contour lines as "two dimensional representations of three dimensional forms."[1] Multiple contour lines are required to describe a three dimensional space.[2] Contour lines within a topographic map provide knowledge related to the location, size, and elevation of landforms including ridges, valleys, summits, and depressions.[2] These maps also serve to illustrate concave and convex slopes.[2] Analyzing and interpreting contour lines allows

landscape architects to visualize specific forms that occupy vertical space and their relationship to one another.[2] It is imperative that designers understand existing contours and the landforms they represent. It is equally important for landscape architects to "understand the implications of changes, both aesthetically and ecologically, that result from altering contours."[3] Utilizing contour lines and topographic maps is a fundamental skill of landscape architects that enables them to represent and understand vertical space in a two dimensional format.

Further knowledge related to topography of landforms and built features can be analyzed by constructing a section. Sections allow for the spatial relationships between horizontal and vertical elements to be visually represented.[4] In addition to representing detailed information related to spatial relationships, these drawings can provide a topographical reading of a landscape and its elements.[5] Sections can also be drawn at different scales to represent vertical space from the small details to large site scale relationships. This allows information that may not be apparent in other drawings, such as topographic maps, to be revealed and more easily communicated.[5] Further, sections can be used to analyze views, illustrate landscape processes and ecological relationships, study landforms and microclimate, and show elements hidden in plan view.[5] The key is that sections represent knowledge concerning the relationships among vertical elements but fail to provide meaningful knowledge of the vertical feature itself.

Sections, along with diagrams and vignettes, can also be used to express knowledge about how vertical design elements change over time. Geology and landforms, plants, walls, building faces, and other vertical features evolve, develop, grow, and morph across various time scales. Some of these processes take millions of years, others change after ten years time, seasonally, or from day to night. All of these time frames are considered by landscape architects depending on the vertical space of interest. Graphic representation of this knowledge can take on many forms such as, but not limited to, a phasing diagram, a group of vignettes or a series of sections. Take James Corner's design proposal for Freshkills Park in New York as an example. To describe his knowledge about how the heights of plants and resulting habitats would grow over a thirty year period, Corner used two section drawings.[6] The first showed the height of plants between zero and fifteen years and the second showed the greater height of these plants between fifteen and thirty years.[6] Landscape architects are

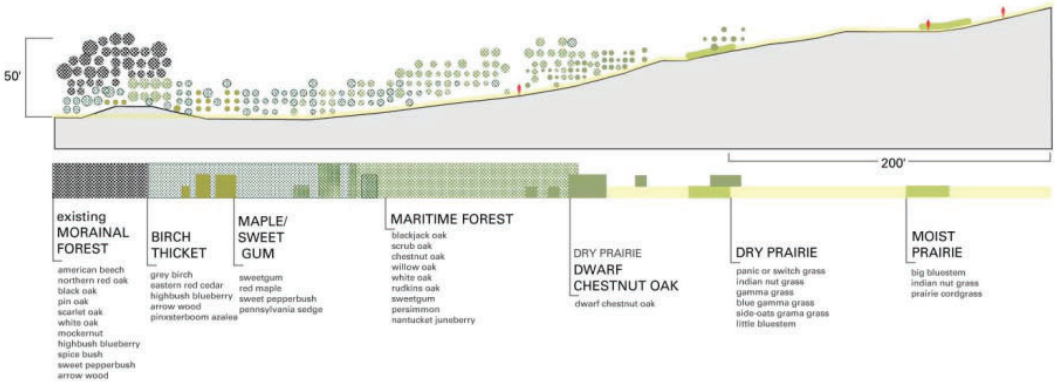
Figure 16: A map of Yosemite Valley detailing points of interest and amenities for visitors.[10] Although there are no contour lines on this map, it is representative of the basic types of knowledge about vertical space that landscape architects share through mapping.


Yosemite Basics
You can drive your car in Yosemite, but we urge you to use the free shuttle buses in some areas. See Yosemite Guide for shuttle schedules and maps plus important information on safety and accessibility, a programs and activities calendar, visitor center and museum hours, bookstores, galleries, other facilities and services, and general park information. For advance trip planning see "More Information" below.
Reservations are not required to enter Yosemite, but you need them for lodging and most campgrounds. Entrance fees are charged. Snow closes some areas to cars in winter.
Accessibility We strive to make our facilities, services, and programs accessible to all. For information go to a visitor center, ask a ranger, call, or check our website.
Emergencies call 911
More Information
Yosemite National Park, PO Box 577
Yosemite National Park, CA 95389-0577
209-372-0200 or TTY 209-372-4726
www.nps.gov/yose
Green flags on the maps show the information stations and visitor centers. Beige parking icons show visitor parking for using the shuttle bus system.
Campground reservations Visit the website recreation.gov or call 877-444-6777.
Yosemite National Park is one of over 400 parks in the National Park System. To learn more about parks and National Park Service programs in America's communities, visit www.nps.gov.
National Park Foundation
Join the park community.
www.nationalparks.org
Visiting Yosemite Wilderness on Foot
Visiting Yosemite National Park by Road
Yosemite Valley Visitor Center and Theater
Wawona Visitor Center
Mariposa Grove
Glacier Point
Tunnel View
Bridalveil Fall
El Capitan
Half Dome
Upper Yosemite Fall
Lower Yosemite Fall
Glacier Point Road
Closed approx. November to May
Park and use the free Yosemite Valley Shuttle
Greater Yosemite Area
Please respect this park's 9,000 years of human history. It is illegal to damage, deface, or remove any cultural or historic artifacts from federal lands. Metal detecting is not allowed.

0 - 15 YEARS

HABITAT DIVERSIFICATION OVER TIME

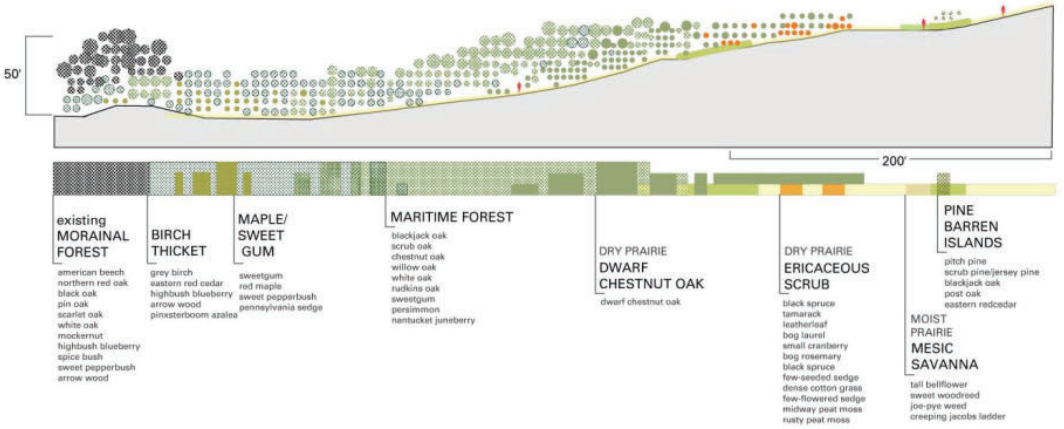
early stages: preliminary plantings related to existing biomass and habitat



15 - 30 YEARS

HABITAT DIVERSIFICATION OVER TIME

developed stages: overlapping inter-plantings and "spread" of seed bank and species, establishing stratified habitat communities and diverse ecological matrices



acutely aware of the ways in which landscapes, including vertical spaces, evolve over time whether the changes are due to biological, geological, social, political, or environmental forces. There are endless imaginative ways that this knowledge is then expressed through diagrams, sections, or vignettes.

Additionally, landscape architects employ mapping as a way of bridging time and space, including vertical space. Maps depict a wealth of diverse knowledge about a place. They can reveal a multilayered history of a place and its larger landscape context, illustrate current patterns, processes, conditions and activities that shape the landscape, and investigate potential futures of a space.[7] This technique of building knowledge works across spatial and temporal scales from the coarse-grained big picture to fine-grained details of any landscape.[7] Further, mapping serves to explore and examine dynamic relationships and processes.[7] In *Emerald City: An Environmental History of Seattle* Matthew Klingle wrote, "the history of Seattle, as of any city, is not a simple narrative of political and economic or social planning. It is always a story of complex causes and complex effects constantly unfolding in place and through time."[7] This can be applied to landscapes outside an urban setting as well. All landscapes, including vertical landscapes, are influenced by and respond to complex and ever-changing natural and human led processes. Landscape architects use mapping as a way of producing, analyzing, and evaluating layered knowledge about a place. While change over time is considered in the practice of mapping, this way of knowing is also an iterative process. There is always something else to be uncovered, to learn from, to adapt to. James Corner gets at this in a quote from *The Agency of Mapping: Speculation, Critique and Intervention*: ". . . mapping as a collective enabling enterprise, a project that both reveals and realizes hidden potential. . . mapping precipitates its most productive effects through a finding that is also a founding; its agency lies in neither reproduction nor imposition but rather in uncovering realities previously unseen or unimagined, even across seemingly exhausted grounds. Thus, mapping unfolds potential; it remakes territory over and over again, each time with new and diverse consequence."[7] Overall, mapping is a great tool that landscape architects use to depict and communicate knowledge about a place over time and spatial scales. This technique can be applied to vertical landscapes although it has predominantly been used to describe landscapes with vertical features rather than focusing solely on the vertical features themselves.

Figure 17: James Corner's design proposal for Freshkills Park utilized a section drawing to depict knowledge about habitat diversification and heights of plants over time.[6]

These means of representation serve to understand and illustrate knowledge about the

general form of the vertical over time and space. A strong focus on relationships in a spatial sense and in regard to their role in general processes is present. However, landscape architects' knowledge of the vertical does not include information about the actual vertical face as a place or characteristics of the vertical plane itself.

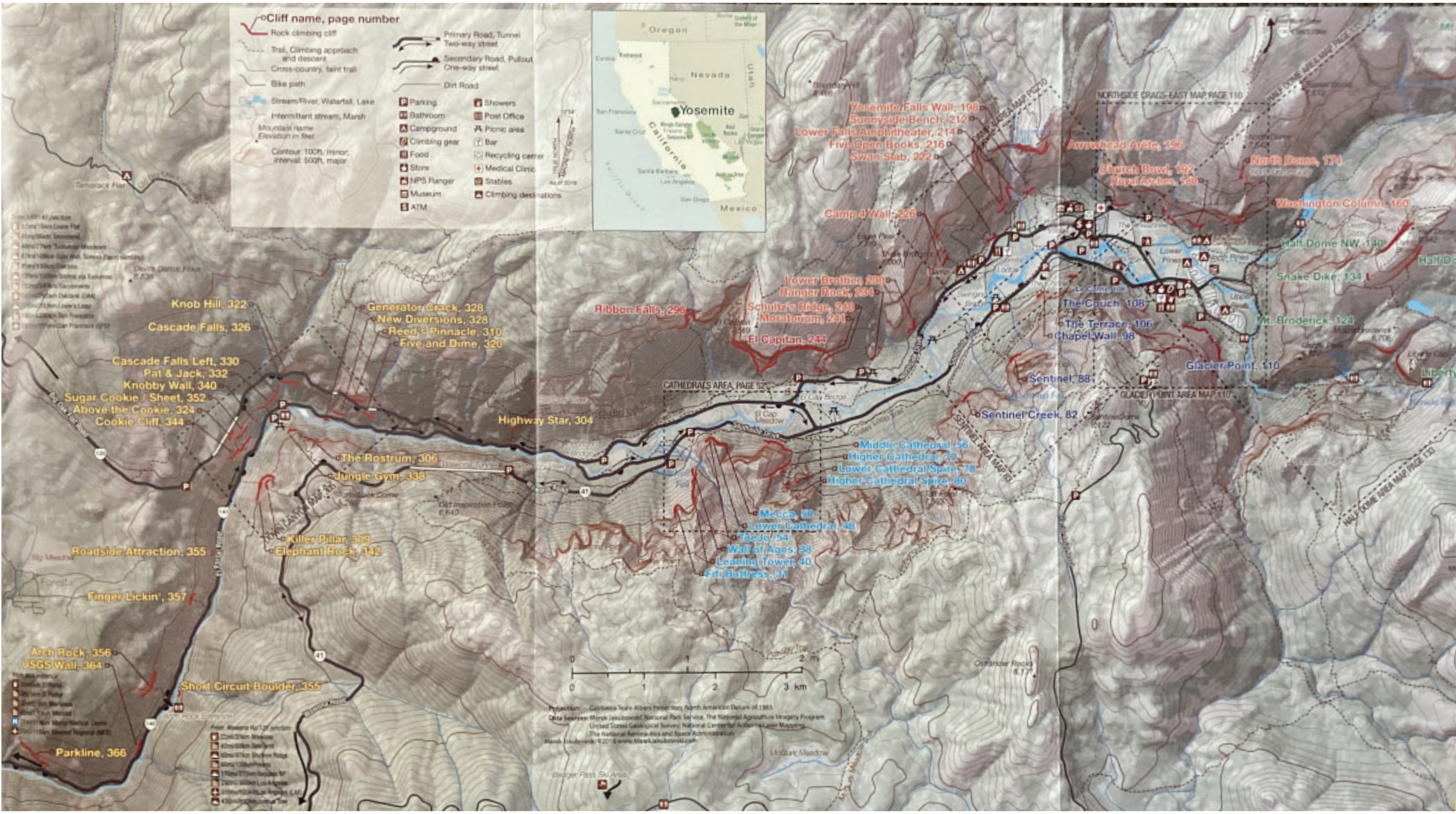
Production of Knowledge by Rock Climbers

Rock climbers have developed their own way of expressing their knowledge of vertical space. While the methods are unique to the sport, they are universal across climbing communities and areas. These techniques will be highlighted by examples of climbing areas in Yosemite National Park.

Like landscape architects, rock climbers also use topographic maps to understand the big picture of a climbing area. However, topographic climbing maps include an additional layer of knowledge related to the vertical dimension. This can include names of climbing areas or cliffs, facilities utilized by climbers such as campsites and toilets, and trails.[8]

The trails shown on topographic maps, along with other secondary or tertiary trails, lead to the base of climbing routes. Hiking up to the wall is the initial step in any rock climbing objective. Climbers possess specific knowledge of these lesser traveled landscapes as the trails they utilize are a vital part of the climbing experience. While these trails may not traverse completely vertical faces, climbers hold experiential knowledge of these slopes. The hike leading up to the base of a climb is called the approach. Much like hiking trails, approaches vary in length, terrain, and difficulty. Few approaches are clearly defined by a maintained trail. Some may branch off of an established hiking trail but most are unmarked and not always clear. These types of trails are referred to informally as "climber's trails." At times it can be difficult to discern the correct direction of a climber's trail. Usually rock cairns are placed at these nodes. Climbers will use these cairns to guide them up a slope in order to access the base of a particular set of routes. This process can sometimes be frustrating, but is part of the adventure that is rock climbing. This challenge also forces climbers to look more closely at the landscape, pay more attention to the details along the way, and carry this knowledge with them, if only to remember the way back to the car after a day of climbing.

Figure 18: A topographic map of Yosemite Valley for climbers incorporates both contour lines and shading to convey landform. Various climbing areas are grouped together and distinguished from one another by the color their name is written in.[6] Each of these cliffs are also highlighted in red along the contour line that corresponds to the base of the climbing area and dashed lines are used to show marked trails leading to some of the climbing routes of the area.[6]



Cliff name, page number
Rock climbing cliff
Trail, Climbing approach and descent
Cross-country, faint trail
Bike path
Stream/River, Waterfall, Lake
Intermittent stream, Marsh
Primary Road, Tunnel Two-way street
Secondary Road, Pullout One-way street
Dirt Road
Parking
Bathroom
Campground
Climbing gear
Food
Store
NPS Ranger
Museum
ATM
Showers
Post Office
Picnic area
Bar
Recycling center
Medical Clinic
Stables
Climbing destinations
Oregon
Nevada
Utah
Yosemite
California
Mexico
Yosemite Falls Wall, 198
Sunnyside Bench, 212
Lower Falls Amphitheater, 214
Five Open Books, 216
Swan Slab, 222
Arrowhead Arête, 156
North Dome, 174
Church Bowl, 192
Royal Arches, 168
Washington Column, 160
Camp 4 Wall, 226
Half Dome NW, 130
Snake Dike, 134
Lower Brother, 250
Ranger Rock, 254
Schultz's Ridge, 248
Moratorium, 244
El Capitan, 244
Ribbon Falls, 298
The Couch, 108
The Terrace, 106
Chapel Wall, 98
Mt. Broderick, 124
Glacier Point, 110
Sentinel, 88
Sentinel Creek, 82
NORTHSIDE CRAGS-EAST MAP PAGE 110
CATHEDRALS AREA, PAGE 52
GLACIER POINT AREA MAP 110
HALF DOME AREA MAP PAGE 130
Knob Hill, 322
Cascade Falls, 326
Generator Crack, 328
New Diversions, 328
Reed's Pinnacle, 310
Five and Dime, 320
Cascade Falls Left, 330
Pat & Jack, 332
Knobby Wall, 340
Sugar Cookie / Sheet, 352
Above the Cookie, 324
Cookie Cliff, 344
Highway Star, 304
The Rostrum, 306
Jungle Gym, 338
Middle Cathedral, 56
Higher Cathedral, 32
Lower Cathedral Spire, 78
Higher Cathedral Spire, 80
Mecca, 50
Lower Cathedral, 48
TaeJo, 54
Wall of Ages, 38
Leaning Tower, 40
Fifi Buttress, 31
Killer Pillar, 309
Elephant Rock, 342
Roadside Attraction, 355
Finger Lickin', 357
Arch Rock, 356
USGS Wall, 364
Short Circuit Boulder, 355
Parkline, 366
El Capitan
Tamarack Flat
Badger Pass Ski Area
0 1 2 3 km
0 1 2 mi

Figure 19:
Counter-Clockwise From Right
My climbing partners hike down the approach trail from the Parkline Slab climbing area. The approach pulled off directly from the road in a faint trail.

The general terrain of this climber's trail included large boulders, scree and sand. It was important to pay attention to footplacement so as not to create small landslides.

A cairn leading us up the trail to the base of the climbing wall.

Approaches are documented and shared through guidebooks and online forums. Guidebooks have been written and compiled for most every rock climbing area in the United States. These books contain valuable information about specific climbing areas and routes in a particular place. Many rock climbers also use Mountain Project, an online forum and phone app, to find their way. This platform uses a crowdsourcing method to gather accurate information about almost 245,000 climbing routes around the world.[9] Each route has a difficulty rating as well as a star rating for how "good" or "fun" people generally think the route is.[9] Any climber with a profile can comment on a route in order to add more information, update the existing information, or give general advice to others looking to climb the same route.[9] GPS coordinates for approaches and the base of climbing routes are often entered into Mountain Project as well.[9] Guidebooks and Mountain Project organize information by geographically nestling a specific route within the climbing wall it is located on and then the general area of rock formations it is in and so on. This way it is easy to see what other climbing routes are on the same rock face and how to find them relative to one another.

Utilizing all of these tools and collective knowledge can be very helpful in locating the route a climber is looking for. For example, while on a site visit to Yosemite National Park for this project, my climbing partners and I were interested in climbing in an area named Parkline Slab in the Down Canyon area of Yosemite.[8] The approach in the guidebook we were using gave us the following instructions: "drive west one mile from the Hwy 140 entrance station. There are two, smaller, paved pullouts. The trail starts in between the pullouts, near a drainage."[11] This was helpful information to get us generally in the correct area. However, the climber's trail is directly off the road and easily missed. Someone had provided GPS coordinates for the start of this trail in Mountain Project which we used to successfully find the beginning of the approach.[8] After trekking up the slope for about fifteen minutes, it became difficult to tell which direction to walk in. Luckily, there were a few cairns marking the way. Once at the base of the rock, we turned to our guidebook once again to locate our desired route on the wall.

Detailed knowledge about a vertical face and the specific climbing routes contained on that wall are described through hand drawn route maps. These maps are reproduced and included in guidebooks or digitized and shared on Mountain Project. A series of symbols and notations is used to depict a particular line, or route, up the face to the summit or finish of the climb. These symbols describe features of the rock, locations of trees or shrubs, general information about how to climb the route, and information about how or where to place gear for protection while climbing.[8] Route maps, as they are called, help a climber prepare for a climb and inform them of what to generally expect

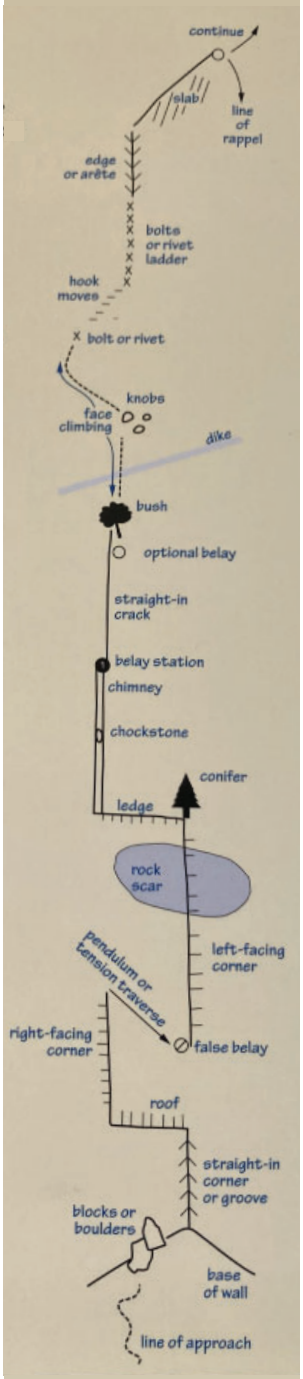
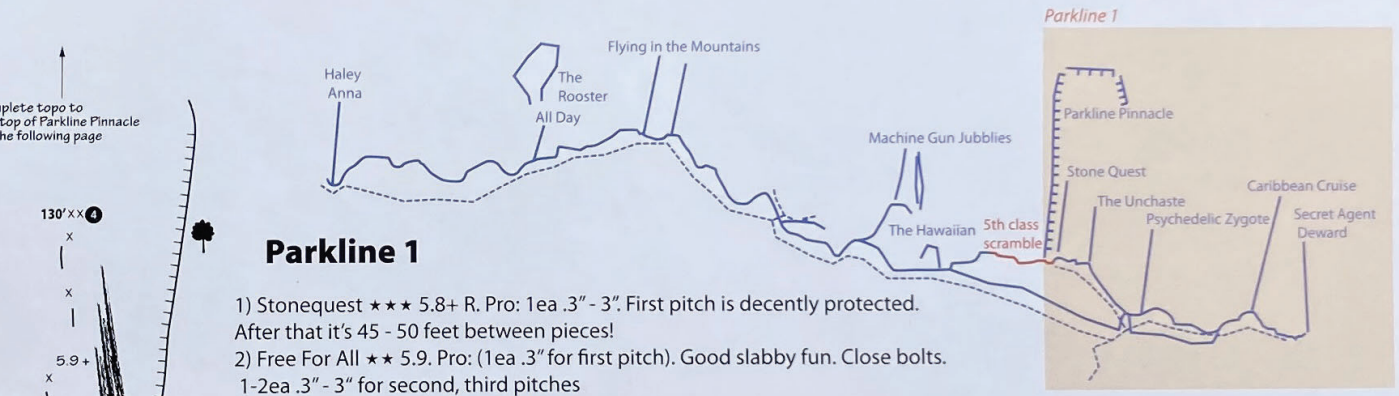


Figure 20:
From Left
A legend of symbols used in route maps.[8]

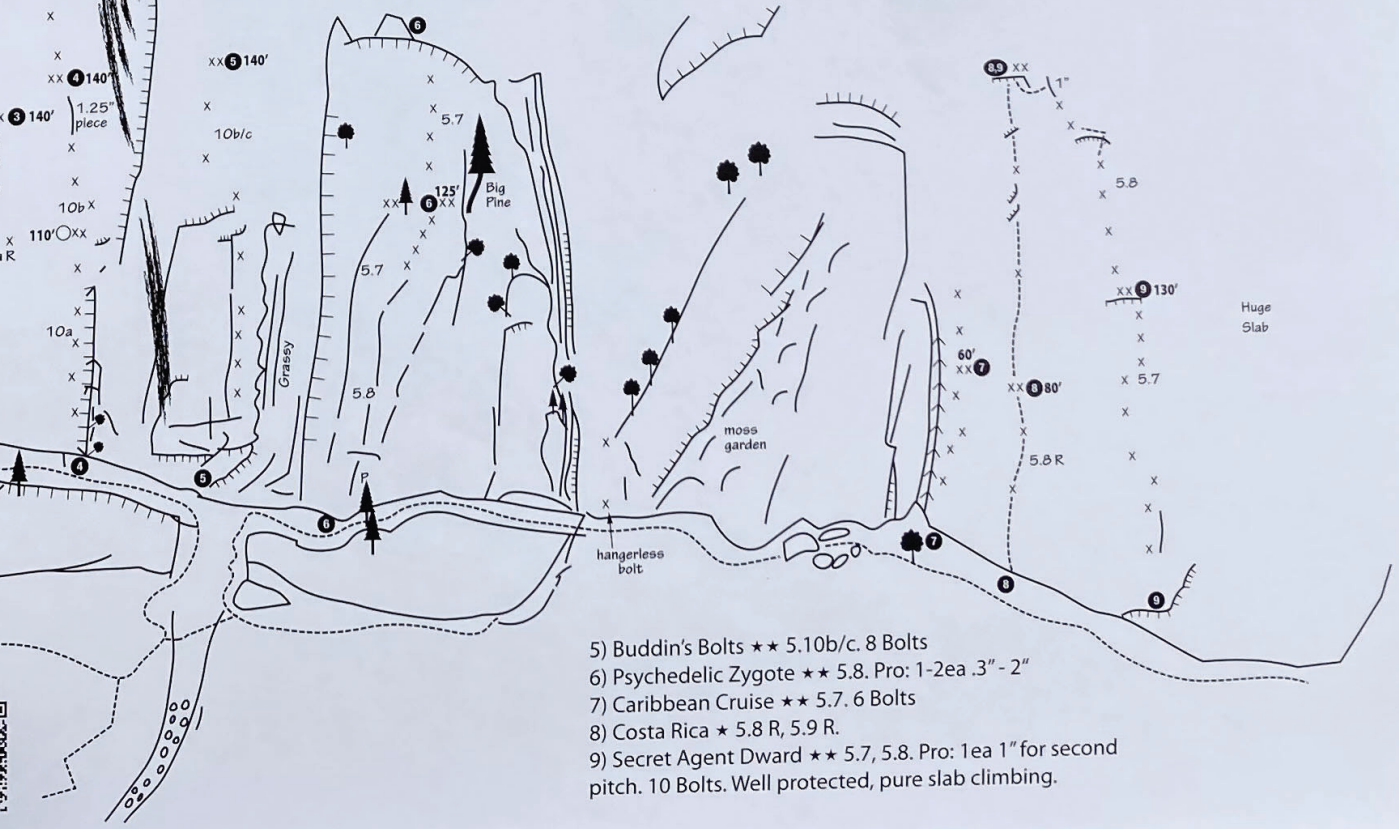
A series of route maps along a portion of a vertical face in Yosemite National Park.[8] The route I climbed while visiting the park is Secret Agent Dward (route number nine).



plete topo to top of Parkline Pinnacle he following page

Parkline 1

1) Stonequest ★★★ 5.8+ R. Pro: 1ea .3" - 3". First pitch is decently protected. After that it's 45 - 50 feet between pieces!
2) Free For All ★★ 5.9. Pro: (1ea .3" for first pitch). Good slabby fun. Close bolts. 1-2ea .3" - 3" for second, third pitches
3) The Chase ★ 10a R. 7 Bolts
4) The Unchaste ★★ 10b. Pro: 1ea .3" - 3". Stout edging!



5) Buddin's Bolts ★★ 5.10b/c. 8 Bolts
6) Psychedelic Zygote ★★ 5.8. Pro: 1-2ea .3" - 2"
7) Caribbean Cruise ★★ 5.7. 6 Bolts
8) Costa Rica ★ 5.8 R, 5.9 R.
9) Secret Agent Dward ★★ 5.7, 5.8. Pro: 1ea 1" for second pitch. 10 Bolts. Well protected, pure slab climbing.

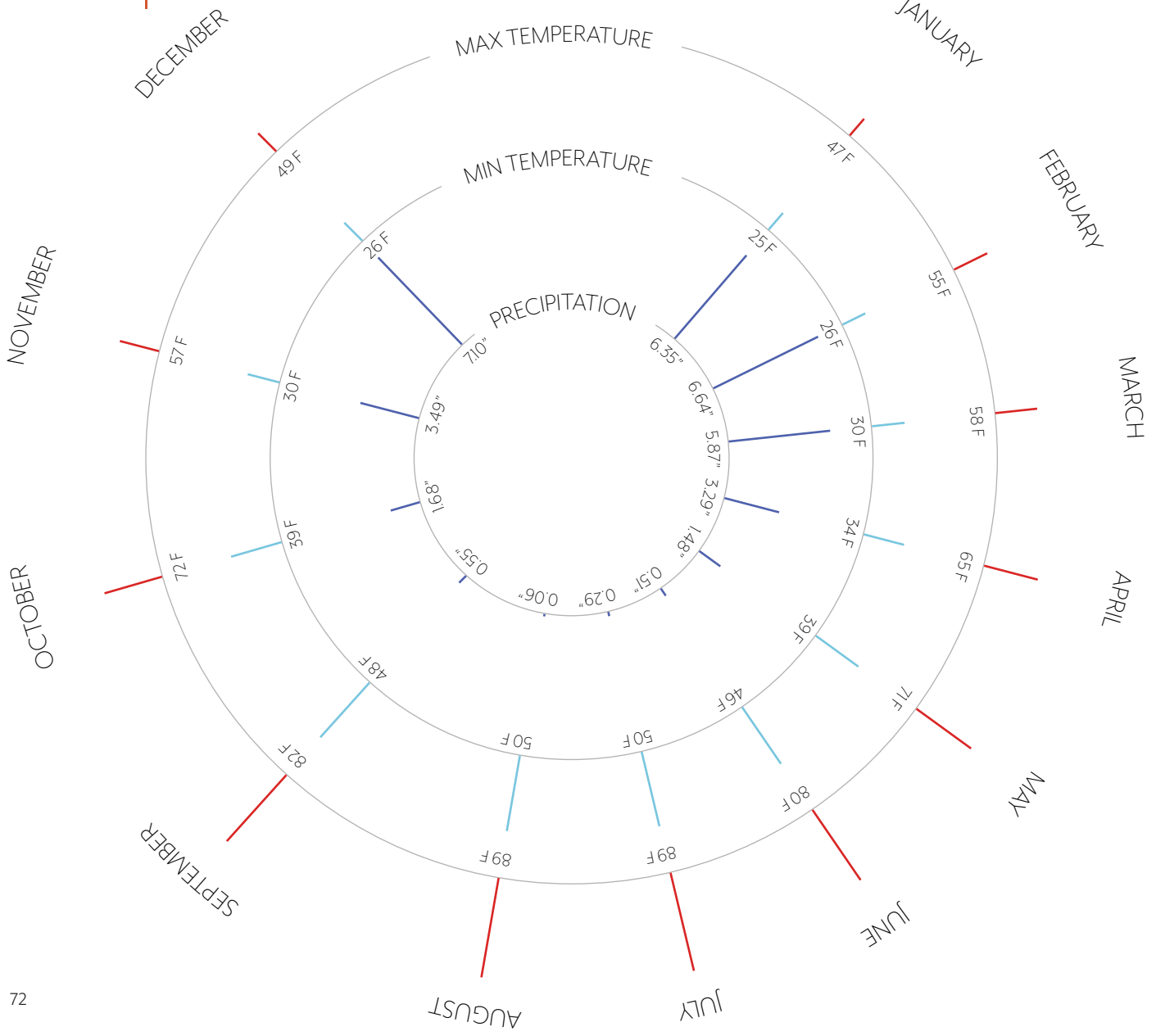
from the rock along the route. These route maps are commonly drawn together to illustrate a section of a vertical face. Distinguishing features on the rock are drawn on these larger maps and can be used as orientation points for climbers to figure out which drawn line matches what part of the rock. Each route map tells a climber specific, detailed information about one line and reading multiple adjacent route maps can provide a broader understanding of that vertical landscape.

Continuing with the previous example, once we arrived at the base of the Parkline Slab climbing area, we searched for our first route of the day. We were aiming to climb a route named Secret Agent Dward. The guidebook provided a line sketch of the defining features of the rock face with the area we were looking for highlighted. We headed in that direction and periodically stopped to look at the book, regain our bearings, and continue on until we found what seemed to be the right place. After discussing that the large crack drawn in the guidebook was indeed the large crack we saw before us, we started looking for bolts running up the face of the rock. There were a couple of different lines of bolts and using the route map allowed us to distinguish which of the lines was Secret Agent Dward. The route map also told us that there would be nine bolts and a bolted anchor on the route. This meant that our lead climber—the first person to climb the route—would need at least nine quickdraws and gear for an anchor. From the route map, we could also see that there would be a nice ledge to stand on while placing the anchor at the top of the route. Route maps and their associated drawings provide climbers with invaluable knowledge about specific details of a rock face as well as the general characteristics of a vertical space.

Rock climbers also possess a wealth of embodied knowledge about the geology, seasonality, and ecology of vertical space. This knowledge reflects an understanding of the implications climbing can have on the environment and a respect for the rock. Most rock climbers are not geologists but they do care about the type and quality of rock they climb on.[12] Various types of climbable rock can be found across the United States from sedimentary rock to igneous and metamorphic rock. Sedimentary rock includes sandstone, limestone and conglomerate rock while igneous and metamorphic rock includes granite, quartz, basalt, and volcanic rock.[13] Each type of rock has distinct attributes that can vary depending on location and weather conditions.[14] Sedimentary rock is porous and absorbs moisture when it rains or snows.[15] A lot of water will soak into the rock, causing the surface, and even the subsurface, to be wet after heavy precipitation.[15] As the rock gets wet, “the cementing agents within the rock are weakened, therefore the rock itself loses a

Figure 21: Using a guidebook to find the route we wanted to climb by comparing the drawings in the book to the features of the rock.

YOSEMITE AVERAGE WEATHER PATTERNS



significant amount of strength."[13] This can ultimately result in the rock breaking apart while still wet, especially if put under the pressure of a hand or foot of a climber.[13] Rock climbers are aware that climbing on wet sedimentary rock can damage the rock and potentially alter a climbing route permanently.[13] Most climbers know to wait 24 to 36 hours after it rains before seeking out a route on this type of rock, and look to the ground on the way to and at the base of a climb to determine if the area is dry enough for climbing.[13] Igneous and metamorphic rocks, on the other hand, are hard, erosion resistant, and generally impermeable.[15] Water tends to run off, allowing the surface to dry relatively quickly, even on cloudy days.[15] This makes it easy for climbers to assess the moisture level of the rock's surface and determine if they feel comfortable climbing in the given circumstance.[15] Igneous and metamorphic rock are considered okay to climb while wet as climbing the rock when wet will not impact it any differently than climbing the rock when dry.[13] In these situations, it is more important to remain conscious of foot placements on the wall because the rubber on climbing shoes may not stick as well when the rock is wet.[13]

Granite is one of the most common types of rock found in the United States, including in Yosemite.[14] Granite is created when magma below the earth's surface is slowly cooled and hardened which results in a variety of forms.[12] This means that climbing on granite rock in one area has the potential to be much different than climbing on granite in another.[16] Although, generally, granite rock has a coarse and grainy surface with quartz and feldspars scattered throughout making it exceptionally solid.[12] Weathering over time can make granite either smooth and slippery or rough and grippy.[14] Further, erosion in granite most often occurs vertically, creating wide enough cracks for climbing.[12] These wide cracks and grippy texture are distinct features of the granite rock walls in Yosemite. This type of rock is best climbed in certain conditions. A greater amount of friction between the rubber of a climbing sole and the granite can be achieved when the rock is colder. With this in mind, climbers tend to climb in the morning or early evening hours, especially on hot days.

The best times to climb in the Yosemite Valley also change seasonally. Climbing routes in Yosemite start at elevations between 2,800 feet and 7,500 feet so these areas are susceptible to the seasonal weather climate of the mountains.[17] Spring and fall typically have the best climbing weather with dry conditions and partial sun that keeps the valley warm but not hot.[17] The summers usually present uncomfortably hot conditions where even the granite is too warm to touch for substantial periods of time while winters are prone to months of wet and severe storms.[17] More specifically,

Figure 22: Diagram of the average weather patterns in Yosemite National Park.

November to March usually experience an even mixture of clear and stormy days with few tourists and climbers around, making this an ideal time to climb in the valley for an extended period of time.[17] From April to May, the climbing walls and valley remain uncrowded, and temperatures begin to rise, however an even chance of beautiful or miserable weather still exists.[17] May to June brings crowds of tourists and climbers along with perfect climbing weather and longer days, while July to August presents temperatures between 90 and 100 degrees Fahrenheit.[17] Climbing in the valley in this type of heat can be miserable so most climbers leave to find cooler weather around this time.[17] Another great time to climb in the valley is between September and October when the weather starts to cool off, however the area can be very crowded with sightseers and climbers.[17]

With an eye for detail and recurring intimate experiences with the vertical, rock climbers also develop some knowledge related to the ecology of these landscapes. Climbing walls and crags "are an integral part of a larger ecosystem."[18] Attentive climbers will observe various plants and animals that make up this greater web of species.[8] While climbing in the Yosemite Valley, for example, climbers are likely to encounter many different trees, flowers, birds, mammals, reptiles and amphibians.[8] The Sierra Nevada has some of the greatest plant diversity in the United States and rock climbers often come into contact with these vibrant communities.[8] Towering evergreens and colorful alpine flowers can be found on the approach to a climbing area, at the base of a route, or even growing on a crack or ledge halfway up the wall.[8] These bushes and trees are also used as landmarks in climbing route maps. Squirrels in the area have also been known to scramble up the rock faces while rattlesnakes slither through the vertical cracks.[8] Black bears too have been spotted wandering over gentle slopes.[8] Some of these creatures reside within the cracks of the vertical face. In an interview, Alex Honnold talked about the creatures he came into contact with while climbing the Nose route in the dark.[19] He talked about the "bugs, mice, bats, even frogs that live in the cracks" along with giant centipede insects.[19] Rock climbers bear witness to these habitats. Further, they are often rewarded with the best views of the cliffs and the birds who call those ledges home.[8] Peregrine falcons, swifts and ravens can be seen high above the valley catching warm air updrafts to keep them soaring.[8] Climbers are more aware of the Peregrine falcons, as the National Park Service will close certain climbing areas for the raptors depending on where they nest in the spring.[17]

While climbing in Yosemite, I saw ponderosa pine trees, a couple different species of fir tree, and black oaks on the approach to the Parkline Slab climbing area. A portion of these trees had singed bark, evidence of the wildfires that had recently come through parts of the valley. At the base of the climb, small purple, blue, and yellow flowers

Figure 22:
Clockwise From Left
Various plants, mosses and lichen grow in the cracks along the vertical face of a rock wall in Yosemite National Park, providing habitat and nutrition for a range of species.

Burnt trees along the approach to a climbing area provide evidence of recent wildfires.

A caterpillar crawls over a leaf along an approach trail.

were in bloom. There were also a number of different types of mosses and lichen growing on the rock face and within the cracks nearby. On the descent, we noticed a group of caterpillars and a glasswing butterfly on a low, leafy plant.

Through observation, climbers do recognize the ecosystems that exist alongside them in these vertical landscapes. Their knowledge in this area may be limited but it is useful in understanding how to interact with these spaces in a way that is respectful of other species.

Overall, climbers are acutely in tune with daily and seasonal conditions of various rock types. They hold important knowledge of these vertical spaces that translates to an understanding of when conditions are best for climbing so as not to damage the rock and leave a minimal impact on the outdoors.[13] The desire to know and be deeply acquainted with the vertical is fundamental to rock climbers. The physical engagement between nature and climbers produces an intimate knowledge of vertical landscapes, a knowledge that is unobtainable when viewing mountain peaks and cliff faces from afar, regardless of the amount of adoration or curiosity that the viewer holds.[20]

Figure 24: Beth Rodden, an American rock climber, free climbs one of the pitches on the Nose route on El Capitan in Yosemite.[8]

Conclusions

There are some similarities and significant differences between the knowledge landscape architects have and what rock climbers know about vertical space. Both of these groups use topographic maps to illustrate vertical space from an aerial view. However, rock climbers highlight different features of these maps than a landscape architect would. Specific knowledge found within these maps is sometimes necessary for a climber to even begin their experience of the vertical. While traditional maps are useful, climbers expand this knowledge base by including additional trails, hints about where climbing areas are located, and tips on how to find them in their own maps. This alternative way of reading and navigating through the landscape provides climbers with a unique experience of the vertical and a different perspective of outdoor landscapes.

Further, landscape architects use section drawings to understand how vertical elements are related to one another spatially while rock climbers use route maps to express particular facets of a vertical face in great detail. Route maps are unique to rock climbing and provide critical knowledge necessary for safety and enjoyment. Knowing the minute details of a specific line up a vertical face allows climbers to succeed in their ascent. While each route map reveals information about a certain piece of the rock, looking at many together provides a broad understanding of an entire

Figure 25: A photo of El Capitan with various climbing routes overlaid and labeled.[8] The green lines are routes that can be free climbed while the red lines are aid climbing routes. This technique is often used to help rock climbers initially understand a climbing area and locate specific routes on a rock face.

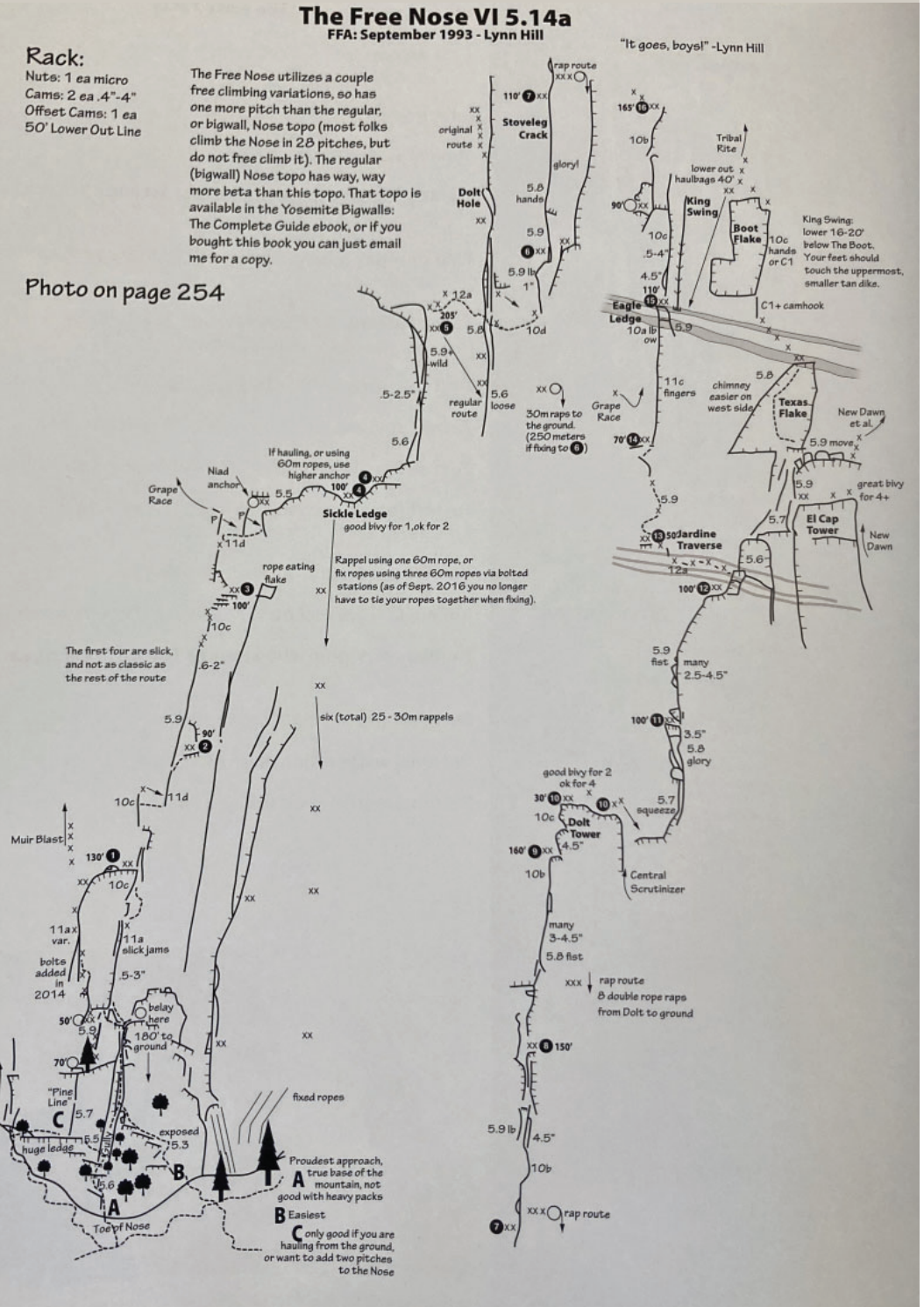


Figure 26: A route map for the Nose climb on El Capitan.[8] Each pitch of the route is labeled in sequence and detailed knowledge about the vertical face is given as well as information on how to climb the route.

vertical face as well. This gives rock climbers very detailed and holistic knowledge of vertical space at the same time. Additionally, this information is shared openly throughout the climbing community through the use of crowdsourced websites, guidebooks, and word of mouth. Landscape architects also consider a variety of time scales and the influence these may have on vertical space as it relates to ecology and plant evolution. They hold vital information related to complex, interconnected ecological systems. This knowledge enables designers to effectively design and manage spaces in ways that benefit all forms of life. Rock climbers, on the other hand, consider vertical landscapes on a daily or seasonal scale with the goal of evaluating when the best time to climb will be. Climbers notice the localized ecological systems they interact with, and have a basic understanding of their personal role in the greater systems at play.

Endnotes:

1. Woland, Jake, Steven Strom, and Kurt Nathan. *Site Engineering for Landscape Architects*. 6th ed. Hoboken, NJ: John Wiley & Sons, Inc., 2013. 34.

2. Woland, Jake, Steven Strom, and Kurt Nathan. *Site Engineering for Landscape Architects*. 6th ed. Hoboken, NJ: John Wiley & Sons, Inc., 2013.

3. Woland, Jake, Steven Strom, and Kurt Nathan. *Site Engineering for Landscape Architects*. 6th ed. Hoboken, NJ: John Wiley & Sons, Inc., 2013. 35.

4. Reid, Grant W. *Landscape Graphics: Plan, Section, and Perspective Drawing of Landscape Spaces*. New York, NY: Watson-Guptill Publications, 2002.

5. Amoroso, Nadia, Daniel H. Ortega, and Jonathon R. Anderson. Essay. In Representing Landscapes: Digital, 129–35. Abingdon, United Kingdom: Routledge, 2015.

6. Corner, James. FRESH KILLS PARK: LIFESCAPE STATEN ISLAND, NEW YORK DRAFT MASTER PLAN. Field Operations, March 2006. https://freshkillspark.org/wp-content/uploads/2013/07/Fresh-Kills-Park-Draft-Master-Plan.pdf.

7. Johnson, Julie, and Brooke Sullivan. Letter to LARCH 303. "Ecological Systems Studio Handouts." WA: Seattle, 2019.

8. Sloan, Erik, and Marek Jakubowski. *Rock Climbing Yosemite Valley: 750 Best Free Routes*. Mariposa, CA: Yosemite Bigwalls, 2020.

9. "Rock Climbing Guides: Routes, Photos & Forum." Mountain Project. Accessed April 27, 2021. https://www.mountainproject.com/.

10. National Park Service. "Yosemite Basics." n.d. Map. Yosemite.

11. Sloan, Erik, and Marek Jakubowski. *Rock Climbing Yosemite Valley: 750 Best Free Routes*. Mariposa, CA: Yosemite Bigwalls, 2020. 366.

12. Eberhardt, Danny. "Don't Take It for Granite: Understanding Different Rock Types for Climbing." Moja Gear, March 7, 2016. https://mojagear.com/dont-take-it-for-granite/.

13. "Climbing After Rain: A Guide to Wet Rock." Web log. Sender One Climbing (blog), March 15, 2019. https://www.senderoneclimbing.com/climbing-after-rain-a-guide-to-wet-rock/.

14. Paul. "5 Different Rock Types Found When Climbing Outside." Rock Climbing Central. Rock Climbing Central, April 22, 2020. https://rockclimbingcentral.com/5-different-rock-types-found-when-climbing-outside/.

15. Green, Stewart. "6 Tips to Assess Wet Rock Before Climbing." LiveAbout, March 17, 2017. https://www.liveabout.com/how-to-assess-wet-rock-before-climbing-756021#:~:text=Climb%20Granite%20and%20Metamorphic%20Rock%20after%20Rain&text=These%20rocks%20are%20hard%2C%20erosion,go%20climbing%20on%20granite%20cliffs.

16. Dawn, Stefani. "Don't Take Granite for Granite." COMMON CLIMBER. Accessed April 28, 2021. https://www.commonclimber.com/granite.html.

17. "Yosemite Climbing Info - Everything You Need to Know About Rock Climbing in Yosemite." SuperTopo. Accessed April 28, 2021. http://www.supertopo.com/climbingareas/yosemite.html.

18. NPS. "Rock Climbing." National Parks Service. U.S. Department of the Interior. Accessed April 29, 2021. https://www.nps.gov/yose/planyourvisit/climbing.htm.

19. "The 25 Greatest Moments in Yosemite Climbing History." Outside Online, June 1, 2016. https://www.outsideonline.com/2075501/25-greatest-moments-yosemite-climbing-history.

20. Joseph III, Taylor E., and Joseph E. Taylor. *Pilgrims of the Vertical Yosemite Rock Climbers and Nature at Risk*. Cambridge, MA: Harvard University Press, 2011.

Diagram Data:
Figure 22: Yosemite National Park Service

5 EXPERIENCING THE VERTICAL

This chapter examines the third aspect of Lefebvre's theory, the production of appropriate and meaningful action in place. This is demonstrated through the assigning of value to vertical space, and the potential experiences imagined to occur in vertical space.

Appropriate Action in Vertical Space as Assigned by Landscape Architecture

Currently, landscape architects do not inherently view vertical landscapes as inhabitable places. Vertical elements are not spaces to be experienced. While this type of space is sometimes managed—at a national or state level—it is not designed for. However, a recognition of the benefits, as they relate to play and exercise, has been established. This is particularly true for children's playgrounds. While this strategy is not universal within landscape architecture, there are a few designers focused on implementing climbing in playgrounds. In an article for the American Society of Landscape Architects in 2015, Chad Kennedy, co-chair of the Children's Outdoor Environments Professional Practice Network,

made the connection between children's development and climbing. He stated that, "a necessary requirement of children's outdoor environments is a provision for gross motor planning and muscle development. Climbing has long been a method of providing the various movements to accomplish this development."[1] Over the last ten years, advancements in building materials and technology have allowed playground designers to "create expressive sculptures that combine the health benefits of climbing while also providing a venue for imaginative play."[1] These advancements in artificial rock fabrication have also brought textures, materials, and forms similar to natural climbing environments to playground.[1] However, the emphasis of these projects remains on designing for children. Climbing structures and inhabiting vertical space, particularly in the built environment, is an experience meant for children.

A few examples of rock climbing structures for people of all ages do exist but not without their own limitations. In these instances, designers have considered rock climbers but without a complete understanding of their experience, resulting in spaces that do not evoke the same experiential qualities of climbing on real rock. For example, Maggie Daley Park in downtown Chicago features an outdoor rock climbing wall.[2] Designed by Michael Van Valkenburgh Associates and opened in 2015, the climbing facility is located within the "play axis" of the park.[3] The two 40-foot tall structures make up "Chicago's first and only Climbing Park," and provide participants with a stunning and unique view of the city.[4] Park staff provides instruction and supervises the walls which have been divided into beginner and advanced areas.[4] Anywhere from 25 to 100 climbers can be accommodated at one time.[4] This aspect of Maggie Daley Park brings outdoor climbing to a highly urbanized area and people of all ages and skill levels. However, the artificial structure resembles an indoor gym climbing environment more than an actual vertical rock face. The colored holds direct climbers to the top, leaving out an important aspect of outdoor climbing: the mystery of finding a positive hold on your own. Further, the smooth texture of the wall leaves something to be desired in relation to actual rock. This park also requires a fee for participation starting at twenty five dollars for a thirty minute session, creating a barrier for entry.[4]

On the other hand, Marymoor Park in Redmond, Washington, has a 35-foot freestanding structure that is free to use.[7] This structure is comprised of more than 35 climbing routes ranging from easy to difficult.[8] The artificial material used to create the piece is reminiscent of actual rock in color and texture.[8] Woodchips fully encompass the wall to facilitate safe falls.[8] The Marymoor climbing wall is a great place to learn how to transition from indoor climbing to outdoor climbing, and always remains open to the public.[8] Rock climbers have even put the routes on this artificial structure in the

Figure 27:
Clockwise From Left
Children play on an imitation rock feature at Sunbird Park in Vail, Colorado.[5]

Rock climbers scale the walls of Maggie Daley Park's climbing area in the heart of downtown Chicago, Illinois.[6]

The artificial rock wall at Marymoor Park in Redmond, Washington.[7]

online database Mountain Project.

There is also an outdoor rock climbing structure just south of Husky Stadium on University of Washington property named the Husky Climbing Rock.[9] The concrete blocks, which were poured and positioned in 1975, are now threatened by the University of Washington's Master Plan.[9] As the university expands, it has proposed replacing the climbing area with a building.[10] A petition to protect the rock was created in response.[10] Climber and biology professor Richard Ellison started the petition.[10] He "objected to the rock's omission from the proposed master plan," and feels it deserves recognition.[10] In an interview, Ellison stated: "It would be a tremendous loss to the Seattle climbing community and University of Washington if the UW rock was removed, modified, or destroyed."[10] This climbing area holds importance to a large community of rock climbers across the university as well as the city. The value of this vertical landscape is not recognized or understood by the landscape architects, among others, who have proposed the university's Master Plan.

While vertical spaces for climbing have been incorporated into the design of a few projects, they are far removed from the real embodied experience of rock climbing on natural rock. Outside of designing explicit rock climbing structures, landscape architects do not consider vertical space to be inhabitable. Looking at the vertical dimension from that perspective is not done in the practice of landscape design as it exists today, especially in urban settings. It is evident that landscape architects do not fully recognize the value of vertical spaces as few inhabitable walls exist in design projects.

Figure 28: A climber and university student works the moves of a route on the Husky Climbing Rock located at the south end of the parking lot next to Husky Stadium.[10]

Appropriate Action in Vertical Space as Assigned by Rock Climbers

The epitome of occupying vertical space lies with rock climbers' experiences. Their main purpose is the pursuit of the vertical, and they are committed to taking action on steep terrain. Rock climbing is a detail-oriented experience that requires an intimate engagement of all five senses, physical strength, and mental stamina. These experiences are also wrapped in a layer of emotion. Ultimately, this leads rock climbers to a deep appreciation and valuing of vertical landscapes.

First and foremost, rock climbing involves an unparalleled awareness of the body and the way it moves.[1] Climbers balance on the smallest of edges, hold onto miniscule rock features, keep their hips as close to the wall as possible, shift their weight to provide maximum momentum, and tense their bodies to resist the pull of gravity. Ultimately, "rock climbing is like a timed jigsaw

puzzle, in which the piece that you are currently trying to place is your own body, and the time element is your diminishing stamina."[11] There is an artistry and level of skill that comes with climbing.[11] The strength and technique required to master this craft are learned over time. After repeated attempts and consistent practice, the successful body movements are ingrained and become second nature.

These movements also require the involvement of all five senses as rock climbing is a sensory sport. Touch is the most important of these—"touch is the pivotal sense utilized by climbers in learning to know a climb."[11] Understanding the texture of the rock and how it responds to weight and pressure in various directions is a necessary first step in rock climbing. The skin of a climber becomes "scratched, calloused, and scarred, especially on the fingers from grabbing holds and on hands and arms as a result of jamming appendages into cracks."[11] Other body parts are also pressed against the rock from time to time presenting the entire body with a sensational experience of the rock. The texture, temperature, and reaction of the vertical face is felt. Even the toes of a climber can feel the sharp edges of a rock's surface through the rubber soles of their shoes.

The act of rock climbing is not only physical—it is an emotional experience as well. Lynn Hill, the first person to free climb the Nose route, in an interview about her experience with rock climbing said, "your whole being is completely absorbed in the experience, a moving meditation."[13] Climbing takes a deep focus, mental fortitude, and emotional control. There is a constant battle being fought in the mind of a climber as determination and focus attempt to hold out over rising fear and doubt. Coupled with this is a sense of peace and freedom achieved in the meditative flow state of climbing.[1] All the noise falls away and nothing matters but that exact moment in time. Each moment builds on the next and creates a sense of confidence, pride, satisfaction, and accomplishment. These moments are shared as there is a communal nature of rock climbing. A trust is built between the rock and the climber and an even deeper bond is formed between climbing partners. This feeling of connection extends to nature as well. In an interview, Alex Honnold said, "being by yourself on a huge big wall, it just puts you in your place but you also feel a part of something bigger."[13] Rock climbing has an uncanny way of making a climber feel like they are the only person in universe and the tiniest speck of an organism at the same time. There is a sense of respect felt for the towering walls of rock, even after making it to the top of a climb. When recalling the ascent of El Capitan in a day via the Nose route, John Long said, "we didn't feel like conquerors, but honored guests at a shrine."[13]

Figure 29: A collection of photos highlighting the sense of touch found with rock climbing. All photos were taken in Yosemite National Park.









Overall, rock climbing gives many people a sense of purpose and identity. Royal Robbins, a Yosemite climbing pioneer, said, "whenever I get on the rock, I feel it's something that makes me whole."[13] Best of all, rock climbing is a lot of fun!

This sensory and emotional experience is best elaborated through a story - a personal story of climbing my first route in Yosemite. I am by no means an elite climber but Yosemite Valley still has plenty of adventure to offer. Once at the base of our chosen climb, I wiggled into my harness and shoved my feet into my almost too small climbing shoes. I grabbed my helmet from my bag and placed it snuggly on my head before picking up one end of the rope. The rope felt supple in my hands as I tied the knot connecting my harness to the rope. After my climbing partner and I double checked the safety of our setup, I placed my hands on the rock and took a deep breath while the anticipation of the climb washed over me. My partner gave me an encouraging fist bump and I started up the route. The rock felt cold, almost wet, and I could feel my shoes firmly gripping the fine texture of the wall. I leaned in, keeping my body close to the wall as I moved one foot up, and searched for a hold to land on. I looked up, assessing the best strategy forward, and moved a hand. I transitioned into a calm flow as I continued to move a hand here, a foot there, the sound of my breath, a cool breeze on my face. The terrain became steeper and I was pulled from my trance. My hands and legs started to shake a little and a nervous feeling started creeping in. The footholds had become smaller and I had to trust my feet. A sweat started breaking out across my forehead. I took a deep breath and pushed on. The last few moves across the rock felt desperate, and once I reached the anchor at the top of the route, I felt instantly relieved. A smile splashed across my face as I relaxed. I leaned back, took in the grand view around me, and inhaled the fresh air. After I had paused at the top, my partner lowered me back to the base of the climb. I untied from the rope and sat down on the smooth rock. Immediately, I pulled my climbing shoes off my feet, the best feeling of the day.

Figure 30: My perspective of the ground plane after climbing to the top of a route.

Individual experiences like the one I have shared intertwine with others' experiences to produce a tight-knit community of climbers. The essence of this communal spirit is summarized in the following poem published by Patagonia, an outdoor clothing company.

Points of Contact[14]

Our world is stone
Shaped by water and wind
and time
It sweats when it's hot
And sticks when it's cold
It's the place where we

gather
And tape our fingers

And huddle together to wait
out storms
Where we've learned to try
hard
And learned to fail
And sometimes succeed
Learned when to hold on
And when to let go

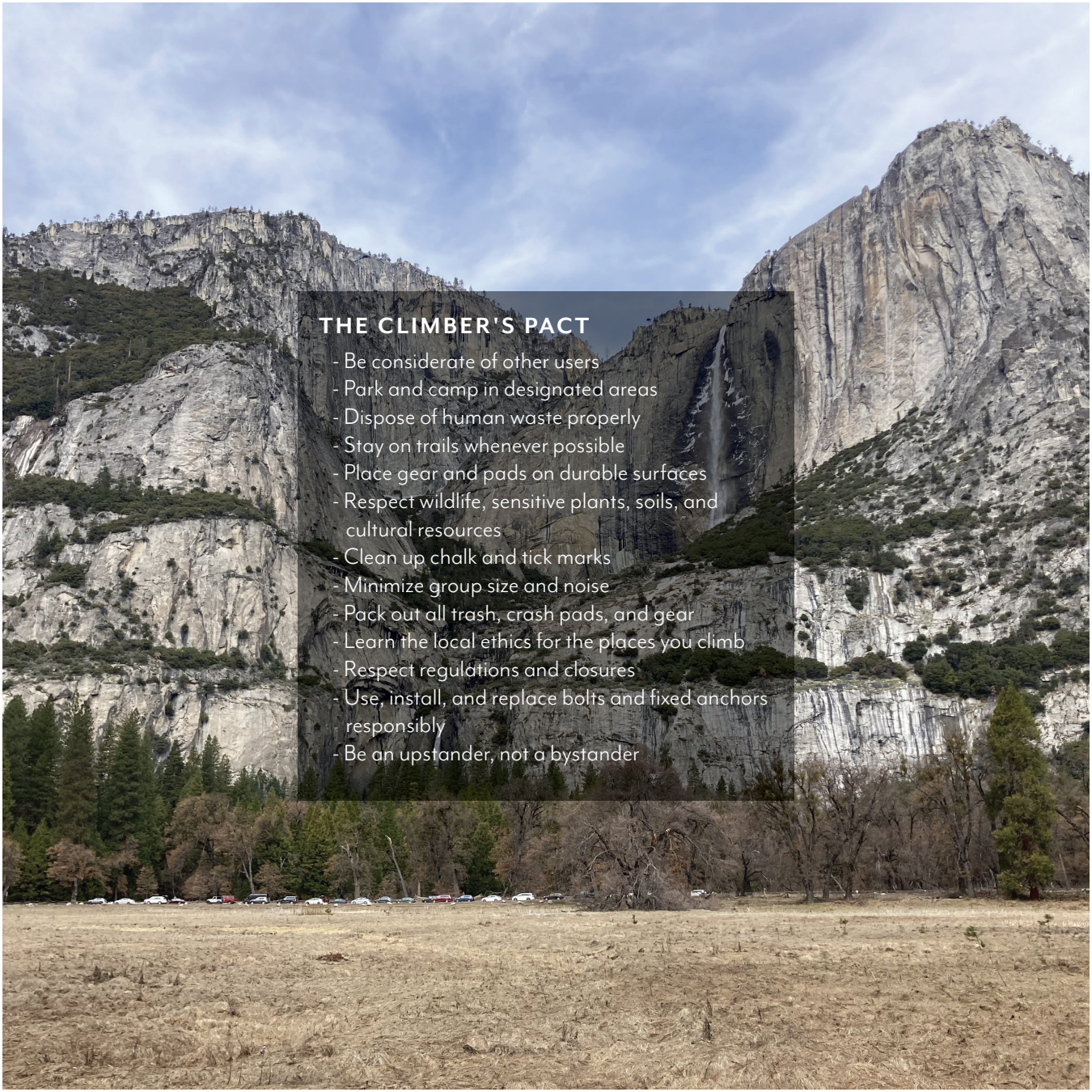
We've made families here
Shared beta
Returned each season, year
after year
Finding our wildness in
wild places
Spoken its language
Studied its cracks and fissures

Its imperfections and its
characters
The moves that make up
each route
The climbs that make up a
life
The voices that make up a
community
The ones that call us back
Home

The act of occupying vertical space through the challenging endeavors of rock climbing brings people together in a profound way. The resulting community is emotionally rich, deeply supportive, and accepting. The climbing community really becomes a family that calls vertical landscapes home.

This notion of the vertical as a home brings rock climbers an intense appreciation of these spaces. Climbers greatly value the places they climb, and they express this sense of gratitude by protecting the areas they love. This relationship stems from the idea of ecological literacy. Ecological literacy is defined as the knowing of ecological perspectives, basics about the earth and how it functions, and an understanding of natural systems and their causes and effects.[16] Ecological literacy requires more than just mental comprehension, however. The capacity to observe nature, absorb insights, and merge the landscape with the mindscape is of equal importance.[16] Climbers embody this through their deep mental concentration and intimate connection to the land, allowing them to be ecologically literate to varying degrees. This ecological literacy is driven by "the sense of wonder, the sheer delight in being alive in a beautiful, mysterious, bountiful world."[17] The bond formed between climber and rock, and

Figure 31: A representation of the vibrancy, strength, sense of accomplishment, and community that comes with rock climbing.[15]


THE CLIMBER'S PACT
- Be considerate of other users
- Park and camp in designated areas
- Dispose of human waste properly
- Stay on trails whenever possible
- Place gear and pads on durable surfaces
- Respect wildlife, sensitive plants, soils, and cultural resources
- Clean up chalk and tick marks
- Minimize group size and noise
- Pack out all trash, crash pads, and gear
- Learn the local ethics for the places you climb
- Respect regulations and closures
- Use, install, and replace bolts and fixed anchors responsibly
- Be an upstander, not a bystander

ultimately the environments these rocks exist in, fosters this deep care for nature. A trust is built, an understanding, between climber and the vertical. A challenge accepted. This kinship with the earth is necessary to preserve natural spaces and resources.[16] It is not enough to be familiar with or enjoy all the natural world has to offer; in order to foster a sense of belonging, more direct contact with these natural places must be present.[16] The climbing experience exemplifies this type of experience. Environmental scholar David Orr writes, "the ecologically literate person has . . . an attitude of care or stewardship. . . Knowing, caring, and practical competence [which can only be derived from the experience of doing] constitute the basis of ecological literacy."[18] The action that rock climbers apply to vertical space creates a sense of inherent value found within those places.

From this ecological literacy and valuing of vertical space, a set of climbing ethics has been established. This code of ethics first emerged in the 1970s when Royal Robbins began to articulate a philosophy of climbing.[13] In an interview, Robbins stated, "getting to the top is nothing, the way you do it is everything."[13] Climbing is not about conquering the rock, but rather how you care for that space as you move through it. Robbins laid out a set of rules for how he felt the walls of Yosemite Valley should be climbed.[13] This included things such as placing minimal bolts on the wall, leaving no trace, and preserving adventure.[13] Aspects of these rules are still present in the Climber's Pact of today. The Climber's Pact is a set of unofficial rules compiled by the Access Fund, a not-for-profit climbing advocacy group focused on promoting an ethic of responsible climbing and conservation of the climbing environment.[19] This set of climbing ethics can be seen at left.

These ethics play out in tangible ways. The Yosemite Facelift program was started in 2010 in an effort to clean up Yosemite National Park.[13] This clean up project and annual event brings rock climbers and park rangers together through their common interest in preserving a beloved environment. More generally, the Access Fund documented that "climbers contributed more than 65,544 volunteer hours toward conservation and land stewardship efforts in 2018."[20] This set of values is instilled in and represented through individuals as well. For Ron Kauk, a legendary American rock climber who spent most of his life in Yosemite, climbing became a personal code of environmental ethics.[21] Kauk's climbing predecessors in Yosemite taught him about respecting the surrounding environment and learning from the natural harmony around him.[21] From these experiences on the wall, he has found serenity with nature and a passionate desire to protect it.[21] In an interview Kauk stated, "the

Figure 32: The Climber's Pact defines an unofficial set of climbing ethics that all climbers know and abide by.[19]

natural world is our source of life. It has made me discover that there is a spirit to all things in nature. Climbing and the rock are incredible teachers about nature and the nature of us. Climbing puts me in balance with the natural world."[21]

This is not to say that there are no negative environmental impacts related to rock climbing. As the number of climbers continues to rise, the impacts become more obvious. These include soil compaction and erosion, vegetation loss, disturbance of cliff-dwelling animals, litter, improper human waste disposal, and the "visual blight of chalk marks, pin scars, bolts, rappel slings, and fixed ropes."[22] While the Climber's Pact seeks to minimize these impacts and preserve the ecological systems and aesthetic beauty of these places, the potency of these guidelines has been diluted by the rapid increase in numbers of people rock climbing. However, a thorough investigation and discussion of this complex topic is beyond the scope of this project. The goal here is to understand that the heart of the climbing community greatly values vertical landscapes, and seeks to protect those environments.

Conclusions

Landscape architecture does not see vertical space as an inhabitable place. Verticality is understood as an object, a face most often void of action. On the other hand, when vertical space is designed for activity, it is limited to the creation of climbing walls that do not fully capture the true rock climbing experience. Ultimately, when understood through their disciplinary lens, the value of vertical spaces as places is lost on landscape designers. Rock climbers on the other hand, actively inhabit vertical space, engaging with, exploring, and intimately interacting with the rock face. These vertical places allow them to "reach for something beyond themselves and travel to a place, physical and mental, where they have never been before."[23] This type of profound experience inscribes values onto public landscapes and reinforces the environmental ethics of the climbing community. Rock climbers recognize that vertical space is a limited resource and it is their responsibility to help protect and preserve that asset.

Endnotes:
1. Zobs, Andris, and Ian Glas. "Climbing in Playgrounds." The Field. ASLA, March 3, 2015. https://thefield.asla.org/2015/03/03/climbing-in-playgrounds/.

2. Bochnowski, Jim. "The Maggie Daley Park Climbing Wall Is Open, But It's Not Cheap." The Chicagoist, May 13, 2015. https://chicagoist.com/2015/05/13/i_went_to_the_maggie_daley_rock_cli.php.

3. "Design." Maggie Daley Park. Chicago Park District. Accessed May 2, 2021. https://maggiedaleypark.com/about/design/.

4. "Climbing Wall-OPENS Memorial Day Weekend." Maggie Daley Park. Accessed May 2, 2021. https://maggiedaleypark.com/things-to-do-see/climbing-wall/.

5. "Inspiration Playground." ID Sculpture Custom Projects Gallery. Accessed May 2, 2021. https://idsculpture.com/projects.html.

6. "Maggie Daley Park." Michael Van Valkenburgh Associates, Inc. Accessed May 2, 2021. https://www.mvvainc.com/project.php?id=61&c=parks.

7. "Marymoor Park." Experience Redmond, March 29, 2018. https://experienceredmond.com/activities-and-attractions/marymoor-park/.

8. "3 FREEkin' Awesome Activities at Marymoor Park." King County Parks, July 29, 2015. https://kingcountyparks.org/2015/07/29/3-freekin-awesome-activities-at-marymoor-park/.

9. "Husky Climbing Rock, Rock Climbing." theCrag. Accessed May 2, 2021. https://www.thecrag.com/en/climbing/united-states/washington/area/690389796.

10. Pulkkinen, Levi. "Seattle Climbers Rally to Protect UW's Weirdest Rock." seattlepi.com. Seattle Post-Intelligencer, November 15, 2016. https://www.seattlepi.com/seattlenews/article/Seattle-climbers-rally-to-protect-UW-s-weirdest-10617317.php#photo-11811518.

11. Kambo, Gurpree. "Scaling the Wall of Toxic Masculinity and Rediscovering Sports as an Adult." The Peak, September 25, 2020. https://the-peak.ca/2020/09/scaling-the-wall-of-toxic-masculinity-and-rediscovering-sports-as-an-adult/.

12. Rickly, Jillian M. "Cultural Geographies." Essay. In Cultural Geographies 24, 24:69–85. 1. London, UK: SAGE, 2017. 75.

13. Valley Uprising. Amazon Prime Video. United States: Sender Films, 2014. https://www.amazon.com/Valley-Uprising-Peter-Sarsgaard/dp/B01M3UPOW/ref=sr_1_1?crid=26EQET27ODTN1&dchild=1&keywords=valley+uprising&qid=1619025572&sprefix=valley+uprising%2Caps%2C304&sr=8-1.

14. "Climbing - Patagonia." Patagonia Outdoor Clothing & Gear. Accessed May 7, 2021. https://www.patagonia.com/climbing/?utm_source=em&utm_medium=email&utm_campaign=050521_climb_voices_all.

15. "AAC Membership." The American Alpine Club. Accessed May 3, 2021. https://americanalpineclub.org/learn-more?utm_source=Facebook&utm_medium=New+Member+Community&utm_campaign=membership2.0&fbclid=IwAR3N0CkWNSB89qnQpoh-u9TPJgv1gCXwWWB80PWv5TVsaWsv0uZ4DXOVZtA.

16. Orr, David W. Essay. In Ecological Literacy: Education and the Transition to a Postmodern World, 85–95. Albany, NY: State University of New York Press, 1992.

17. Orr, David W. Essay. In Ecological Literacy: Education and the Transition to a Postmodern World, 85–95. Albany, NY: State University of New York Press, 1992. 86.

18. Orr, David W. Essay. In Ecological Literacy: Education and the Transition to a Postmodern World, 85–95. Albany, NY: State University of New York Press, 1992. 92.

19. "The Climber's Pact." Access Fund. Accessed April 14, 2021. https://www.accessfund.org/learn/the-climbers-pact.

20. SGB, Media. "American Alpine Club Report Reveals Climbing's Powerful Impact." SGB Media Online, July 11, 2019. https://sgbonline.com/study-reveals-climbings-powerful-impact/.

21. Frohlich, Robert. "Kauk Loosens His Cape." Adventure Sports Journal, September 1, 2010. https://adventuresportsjournal.com/kauk-loosens-his-cape/.

22. NPS. "Rock Climbing." National Parks Service. U.S. Department of the Interior. Accessed April 29, 2021. https://www.nps.gov/yose/planyourvisit/climbing.htm.

23. "Yosemite Climbing Info - Everything You Need to Know About Rock Climbing in Yosemite." SuperTopo. Accessed April 28, 2021. http://www.supertopo.com/climbingareas/yosemite.html.

6 DISCUSSING THE VERTICAL

"As a climber, you see a puzzle of holds. To me it's like an art, a way to express yourself through the harmonizing of your abilities, mind and body, recognizing how fragile we really are. It's always good to remind yourself that it was never about getting to the top of any of these cliffs, just about learning how to be a part of them. That's what nature seems to always want to remind me."

- Ron Kauk[1]

CRACKS ON THE GROUND

OR CRACKS ON THE WALL?

PERSPECTIVE IS EVERYTHING

This thesis has presented an understanding of the meanings, values, and experience of vertical space from the perspective of rock climbers. By bringing this perspective together with that of landscape architects, it is apparent that there are a number of lessons the field can learn from climbers about the vertical dimension. The theoretical framework adopted to place these two groups in conversation can also be applied to these takeaways. A conceptual overlap between the perspectives of landscape architects and rock climbers can thus be posited, see figure 33, which presents several opportunities for the future.

Takeaways |

Defining Vertical Space |
This thesis marks a time for landscape architects to shift and expand their definition of vertical space to include an understanding of these landscapes as places.

Knowledge About Vertical Space |
Rock climbers present landscape architects with a new way of knowing and representing space, offering designers a transformative tool for developing knowledge related to the vertical.

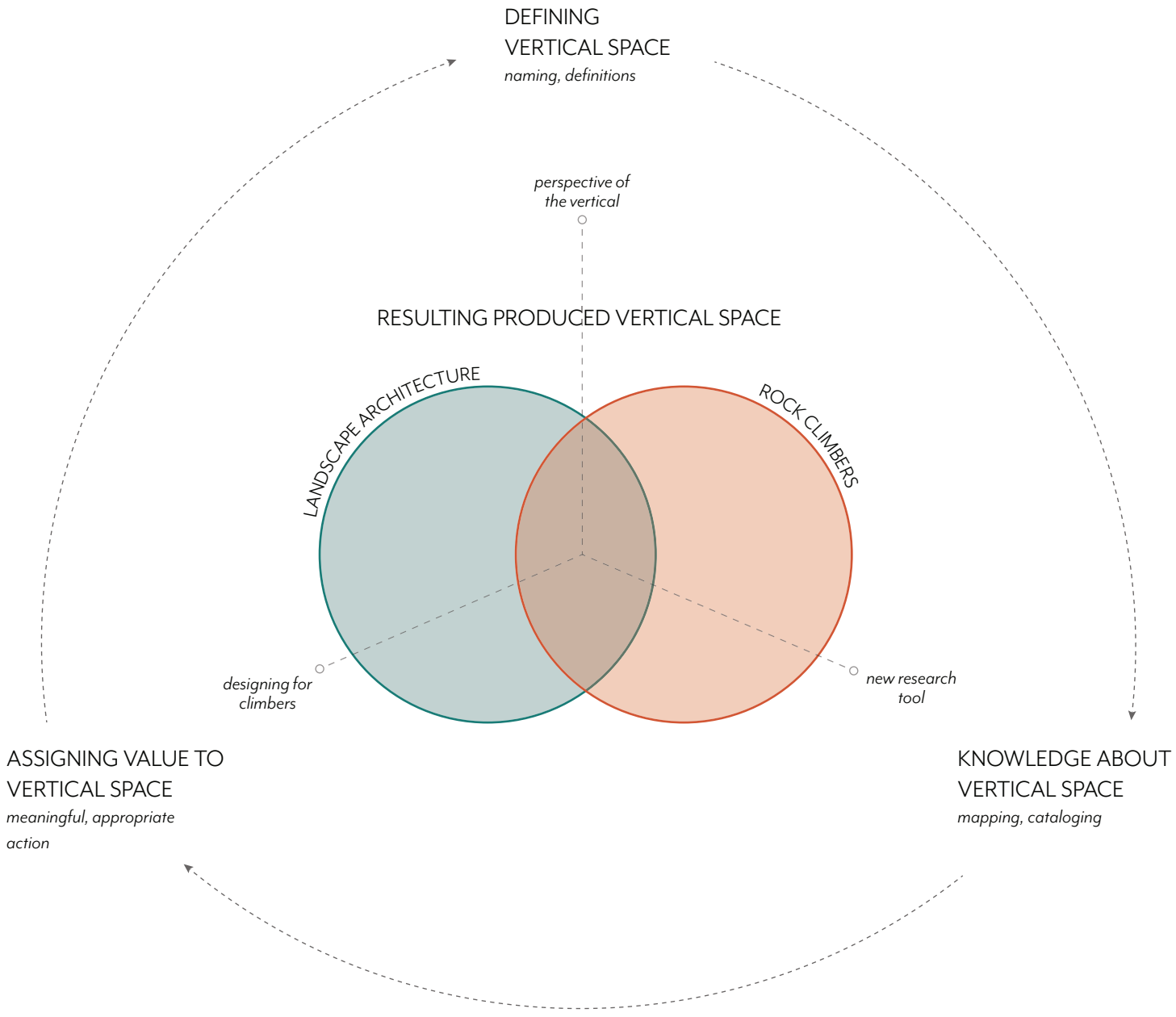
Assigning Value to Vertical Space |
Rock climbing is a growing sport, and this type of user is not generally considered in design. Understanding the embodied experience of rock climbers will aid landscape architects in crafting authentic experiences that will enrich any project.

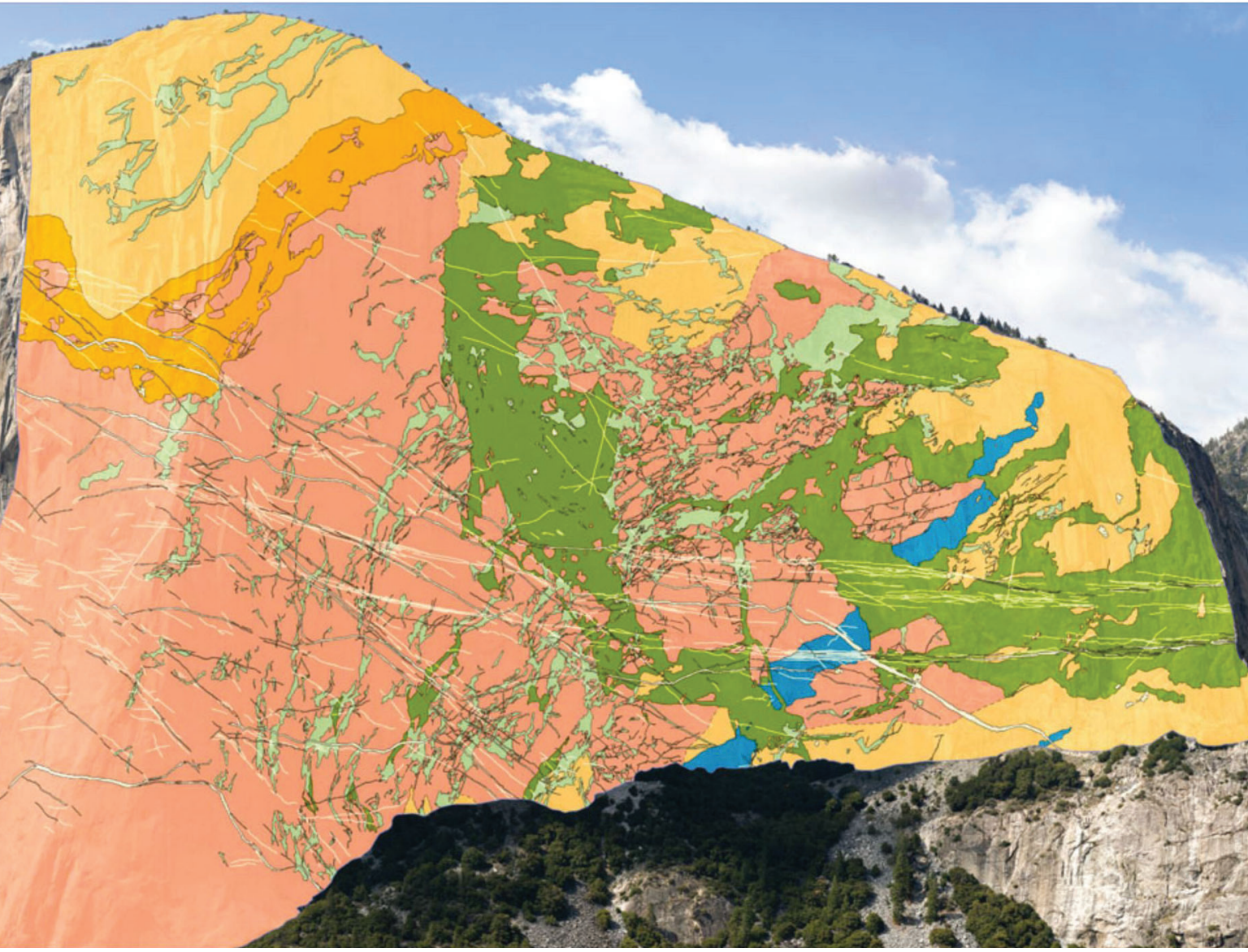
Defining Vertical Space

Generally, landscape architects define vertical space as a design tool - a blank plane to transform and inform the experience of a place. While this notion of verticality is fundamental in design, it can be expanded upon. Shifting the perception of vertical space to include an understanding of it as a place itself opens another dimension to landscape architects.

As revealed by the rock climbing experience, vertical places can be inhabited, support habitat for other organisms, and hold a cultural significance. In natural environments, these vertical places are a limited resource. It takes thousands of years for rock formations to be created beneath the earth's crust and pushed to the surface. Changing the perspective of landscape architects to define these cliffs as inhabitable, valuable, cultural places allows the field to recognize their importance and protect them for the future. What it looks like for landscape architects and rock climbers to work together to protect vertical places is something to be further explored.

Figure 33: Theoretical diagram depicting lessons landscape architects can glean from the rock climbing experience and knowledge of vertical space.


DEFINING
VERTICAL SPACE
naming, definitions
perspective of
the vertical
RESULTING PRODUCED VERTICAL SPACE
LANDSCAPE ARCHITECTURE
ROCK CLIMBERS
designing for
climbers
new research
tool
ASSIGNING VALUE TO
VERTICAL SPACE
meaningful, appropriate
action
KNOWLEDGE ABOUT
VERTICAL SPACE
mapping, cataloging



In relation to landscape design, redefining vertical space as place provides designers with another inhabitable plane to manipulate. Looking at rock climbers has demonstrated that vertical space can, and should, be interacted with. This is not to suggest that every vertical face in a design should be a climbing wall. Rather, it is to say that this plane should be interacted with, inhabited, and designed with as another dimension of place. Exploring and iterating on the various typologies of vertical places within design presents a next step for this research.

Knowledge About Vertical Space

Traditional ways of representing knowledge related to vertical space is primarily limited to topographic maps and section drawings. These methods of representation are useful in understanding spatial relationships among vertical elements, and how these might change over time. However, these drawings do not provide information related to the actual qualities of the vertical plane.

Route maps used by rock climbers provide landscape architects with a new method of depicting knowledge. Climbing route maps display intimate details related to the characteristics and features of a vertical face as well as the movement across these landscapes. Additionally, these maps represent multiple scales of knowledge, from the inch by inch of a vertical line to the overall view of a climb. Placing these individual maps in context with one another provides further information about a vertical plane from an even larger scale. A conventional way of communicating this level of detailed information related to vertical places does not currently exist in the field of landscape architecture. If designers are going to collect a base of information related to vertical landscapes as places, a way of denoting this information is needed. Learning from the route maps of rock climbers is a great place to start.

Utilizing climbing route maps as the basis for the development of a new language in landscape architecture is the next step in this research as it relates to landscape architects' ability to communicate knowledge of vertical landscapes. Further, relating the rock climbing method of transcribing movement up a vertical place to Lawrence Halprin's *Motations* could also be an interesting offshoot of this research. Halprin's concept of 'motation' used representational techniques derived from dance step notation to graphically represent movement.[2] This symbol based method of diagramming space and movement is similar to rock climbing route maps that also use a notation system to represent movement. While Halprin used this concept to

Figure 34: Geologic map of El Capitan's southeast face created by rock climber and geology master's candidate Roger Putnam.[2]

represent motion across the ground plane, route maps depict movement up the vertical plane. Both use a unique symbology that cannot be immediately discerned without deep knowledge of the system.[2] Juxtaposing these two techniques of representing movement through different planes would require an in depth investigation and could prove interesting.

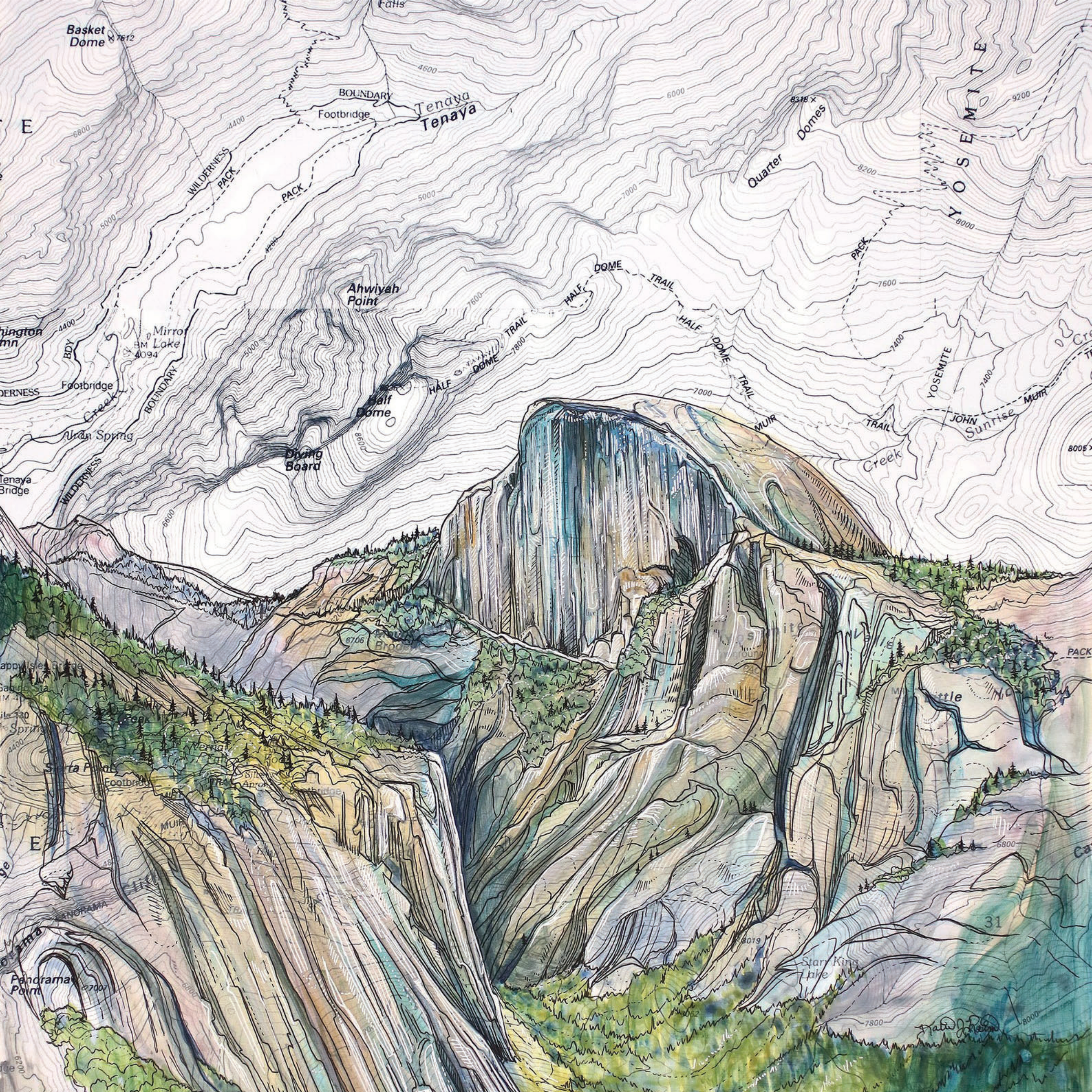
Rock climbing can also be a tool for landscape architects to gather information about vertical places. This can be demonstrated by a geology project focused on the southeast face of El Capitan in Yosemite.[3] Roger Putnam, a rock climber and graduate student at the University of North Carolina, spent a few weeks climbing the face of El Capitan, "taking rock samples and detailed field notes along the way."[3] His efforts aided in the completion of the first-ever high-resolution geologic map of a 3,000 foot tall cliff.[3] Allen Glazner, a professor of geology at the University of North Carolina, had begun the process of mapping the pattern of various igneous rock types that is the face of El Capitan a few years ago.[3] However, he and his students had only been able to access the bottom and top portions of the cliff.[3] Putnam was able to draw on his background as a rock climber to approach the process of gathering data about vertical space from a different perspective.

By thinking explicitly about verticality and his relationship to it, Putnam was able to gain a completely new understanding of data collection at a fine grain level. This case can be viewed as an analogue for applications in landscape architecture. Utilizing rock climbing as a method for gathering information can provide the field with new insights and an increased knowledge base related to vertical places. Complex ecological systems are at play in vertical environments including microclimates, habitat, diverse—even rare—plant communities, and geologic activity to name a few. These are aspects of all places that landscape architects care about. Knowing more about the communities and systems that exist in vertical places will allow landscape architects to be better designers and stewards of the land. Rock climbing as a method can aid in this.

Assigning Value to Vertical Space

Rock climbers are not generally considered users in the field of landscape architecture. However, the popularity of the sport is on the rise and the climbing community continues to grow. Presented here is a critical opportunity for designers to learn from the embodied experience of an emerging site user. Design can be informed and catalyzed through this greater understanding of the rock climber's perspective. Landscape architects meld and honor multiple perspectives through design—

Figure 35: A rock climber's expression of Yosemite Valley (paint over topographic map).[4]


Basket Dome
BOUNDARY
Footbridge
Tenaya
Quarter Domes
YOSEMITE
WILDERNESS
PACK
Ahwiyah Point
Mirror Lake
HALF DOME TRAIL
Half Dome
Diving Board
JOHN MUIR TRAIL
Sunrise
Creek
Panorama Point

it is time to fold rock climbers into this process as well through the integration of climbing with designed features in public spaces.

While climbing structures have occasionally been implemented in built projects, designers can do more to make these authentic experiences reminiscent of the qualities of outdoor rock climbing. The powerful scenery of an outdoor climbing area may not be replicable within design however, the physical, mental, and communal engagement can be. Fostering these aspects can be achieved by creating explorable, textural, evolving vertical places that challenge the user in accessible, fun, and safe ways. Developing this type of space ultimately comes back to landscape architects recognizing and valuing vertical space in design. The various ways in which this type of vertical place takes form is the next step in this research.

Further, integrating true rock climbing experiences into built environments serves more than just the climbing community. Spectators watch climbers in wonder, curiosity and excitement. In this sense, rock climbing can be performative, and a type of spontaneous theatre. This can be observed at Yosemite National Park near El Capitan as well as at the artificial climbing wall in Maggie Daley Park in Chicago where visitors look towards rock climbers from nearby fields. Incorporating vertical spaces in design can create opportunities for informal entertainment in the public realm, and engage with a wider audience.

Figure 36: Spectators gaze up at El Capitan in Yosemite, attempting to catch a glimpse of a rock climber.[5]

Finally, this also presents an opportunity for landscape architects to make the transformative experience of rock climbing accessible to more people. Outdoor rock climbing is not without barriers to entry and equitable access to the sport has not been achieved. However, landscape architects can help bridge this gap by bringing the rock climbing experience to urban settings. Designing vertical places for climbing in diverse environments cultivates the opportunity for anyone to participate in rock climbing. Integrating this into design more consistently, and with a level of care and attention to detail gained by consulting with rock climbers, can offer authentic engagement with the sport by those who are curious as well as experienced climbers.

Conclusion

The rock climbing perspective of vertical space is radically different from that of landscape architects, and it is important as it relates to the design, creation, and stewardship of space. Referring back to Wallace Stevens' poem, *Thirteen Ways of Looking at a Blackbird*, acknowledging multiple perspectives of a landscape allows for a more comprehensive understanding of that space and enriches design. Rock climbing is a

multifaceted, complex sport with technical, social, and physical nuances related to vertical space. Utilizing the knowledge base of rock climbers gives landscape architects the opportunity to creatively explore this spatial dimension with a broader perspective and greater impact on visitors.

The viewpoint presented here reflects the basics of rock climbing in order to identify ways in which they may inform landscape architecture. Through an exploration of academic literature, crowdsourced information, case study of Yosemite National Park, and personal experience, the meanings, experiences and values of vertical space from a rock climbing perspective have been portrayed. As a landscape architecture student and rock climber, I am uniquely positioned to share the insights found in the place where these two groups overlap. This intersection has led to several takeaways for landscape architects, including a redefining of vertical space, a new method of depicting knowledge related to the vertical, and a valuing of the places a growing community deeply respects. Connecting these two groups also provides rock climbers with an opportunity to learn from landscape architects.

While most rock climbers possess a desire to protect the outdoor spaces they love, their knowledge of natural resource and environmental management practices is limited. Natural vertical space is a finite resource. As more people take up the sport of rock climbing, these places are in danger of being overused and loved to death. Landscape architects can aid in informing climbers of best practices related to reducing their impact on these environments. This may come in the form of signage or murals at popular climbing areas, for example. Designers also have a role in further developing and managing vertical places. Creating and maintaining trails to the base of climbing walls to reduce the possibility of erosion and infringing on wildlife, implementing trash cans and bathrooms in highly used areas to minimize the impacts of waste, and setting closure guidelines to protect local species and the cultural practices of other groups are a few possibilities. Further consideration of these options related to maintenance and implementation is necessary and highly worth exploring.

Landscape architects can engage with this community in pursuit of these goals by showing up at any local gym or outdoor climbing area. The climbing community tends to be an open, welcoming group that is interested in sharing their passion with anyone who inquires. Designers can pick up on the language and culture of rock climbers through a few conversations or even attempting the sport themselves.

Ultimately, the rock climbing perspective of the vertical dimension matters because it serves to shift and expand the understanding and conceptualization of vertical landscapes within

the field of landscape architecture. Recognizing vertical space as an inhabitable, explorable place can transform the way landscape architects protect, design, and advocate for these landscapes and communities.

Endnotes:

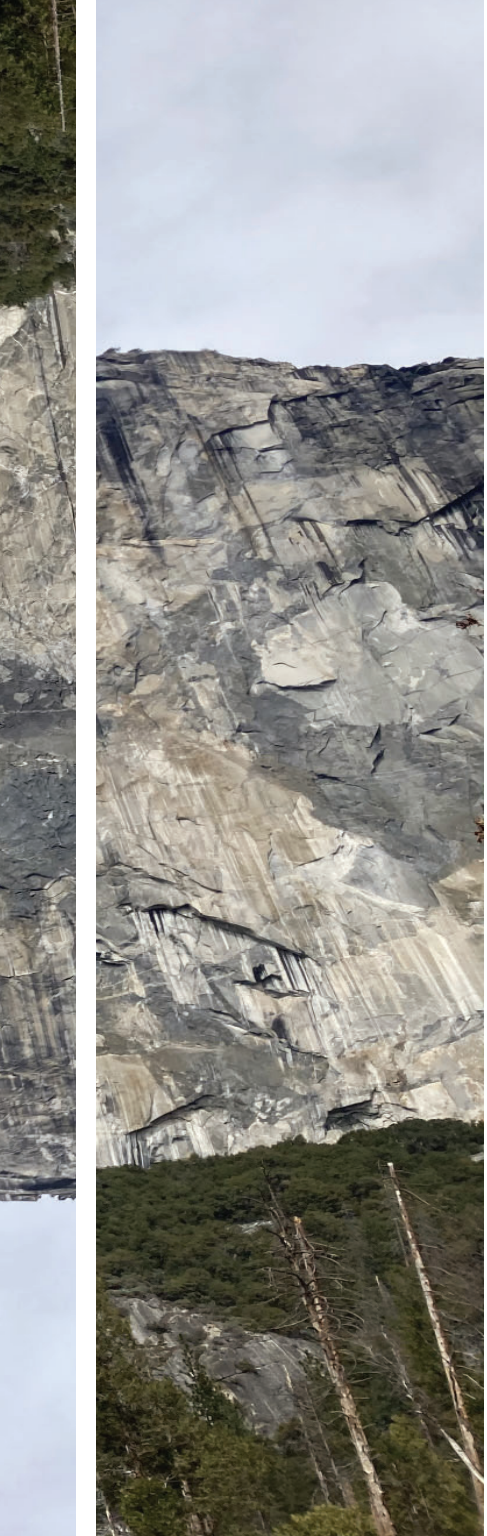
1. Ron Kauk - Mindfulness and Climbing. Snow Creek Consort, 2017. https://www.youtube.com/watch?v=r0K8pBrOdis.

2. King, Jason. "Representing Motion." Web log. *Landscape + Urbanism* (blog), January 1, 2010. http://landscapeandurbanism.blogspot.com/2009/01/representing-motion.html.

3. Howard, Brian Clark. "Yosemite's Iconic El Capitan Mapped in High-Resolution 3D." National Geographic, June 13, 2013. https://www.nationalgeographic.com/science/article/130612-yosemite-el-capitan-rock-mapped.

4. FinalSwitchBack. "Half Dome Art Yosemite Painting Print Illustration." Etsy. Accessed May 10, 2021. https://www.etsy.com/listing/641714642/half-dome-art-yosemite-painting-print?utm_source=Pinterest&utm_medium=PageTools&utm_campaign=Share&utm_term=so.lp.d2.v1&share_

5. Tribune Wire Reports. "2 Americans Complete 'World's Most Difficult' Rock Climb at Yosemite." Chicago Tribune, January 14, 2015. https://www.chicagotribune.com/nation-world/chi-el-capitan-climb--20150114-story.html.



BIBLIOGRAPHY

Bibliography

"The 25 Greatest Moments in Yosemite Climbing History." Outside Online, June 1, 2016. https://www.outsideonline.com/2075501/25-greatest-moments-yosemite-climbing-history.

"3 FREEkin' Awesome Activities at Marymoor Park." King County Parks, July 29, 2015. https://kingcountyparks.org/2015/07/29/3-freekin-awesome-activities-at-marymoor-park/.

"AAC Membership." The American Alpine Club. Accessed May 3, 2021. https://americanalpineclub.org/learn-more?utm_source=Facebook&utm_medium=New+Member+Community&utm_campaign=membership2.0&fbclid=IwAR3N0CkWNSB89qnQpoh-u9TPJgv1gCXwWWB80PWv5TVsaWsv0uZ4DXOVZtA.

American Society of Landscape Architects. "About: ASLA Mission, Vision, Values and Culture." ASLA. Accessed April 19, 2021. https://www.asla.org/ContentDetail.aspx?id=58578.

Amoroso, Nadia, Daniel H. Ortega, and Jonathon R. Anderson. Essay. In *Representing Landscapes: Digital*, 129–35. Abingdon, United Kingdom: Routledge, 2015.

Armand, Agathe. "Climbing Duo on Dawn Wall Success and the Power of Pep Talks." Red Bull. Red Bull, April 10, 2018. https://www.redbull.com/us-en/dawn-wall-interview.

ASLA. "About: What Is Landscape Architecture?" American Society of Landscape Architects. Accessed April 20, 2021. https://www.asla.org/aboutlandscapearchitecture.aspx.

Bailey, Spencer. Tom Kundig on the Parallels Between Mountain Climbing and Architecture. Other. *Time Sensitive*, November 6, 2019. https://timesensitive.fm/episode/tom-kundig-on-the-parallels-between-climbing-and-architecture/.

Bochnowski, Jim. "The Maggie Daley Park Climbing Wall Is Open, But It's Not Cheap." The Chicagoist, May 13, 2015. https://chicagoist.com/2015/05/13/i_went_to_the_maggie_daley_rock_cli.php.

Booth, Norman K. *Foundations of Landscape Architecture: Integrating Form and Space Using the Language of Site Design*. Hoboken, NJ: Wiley, 2012.

Carr, Ethan. *Wilderness by Design: Landscape Architecture and the National Park Service*. Lincoln, Nebraska: University of Nebraska Press, 1999.

Carter, Shan, Wilson Andrews, Derek Watkins, and Joe Ward. "The Dawn Wall: El Capitan's Most Unwelcoming Route." The New York Times. The New York Times, January 10, 2015. https://www.nytimes.com/interactive/2015/01/09/sports/the-dawn-wall-el-capitan.html.

"The Climber's Pact." Access Fund. Accessed April 14, 2021. https://www.accessfund.org/learn/the-climbers-pact.

"Climbing - Patagonia." Patagonia Outdoor Clothing & Gear. Accessed May 7, 2021. https://www.patagonia.com/climbing/?utm_source=em&utm_medium=email&utm_campaign=050521_climb_voices_all.

"Climbing After Rain: A Guide to Wet Rock." Web log. Sender One Climbing (blog), March 15, 2019. https://www.senderoneclimbing.com/climbing-after-rain-a-guide-to-wet-rock/.

"Climbing Wall-OPENS Memorial Day Weekend." Maggie Daley Park. Accessed May 2, 2021. https://maggiedaleypark.com/things-to-do-see/climbing-wall/.

Collins, Jeremy. *Drawn: The Art of Ascent.* Seattle, WA: Mountaineers Books, 2015.

Corner, James. *FRESH KILLS PARK: LIFESCAPE STATEN ISLAND, NEW YORK DRAFT MASTER PLAN*. Field Operations, March 2006. https://freshkillspark.org/wp-content/uploads/2013/07/Fresh-Kills-Park-Draft-Master-Plan.pdf.

Daumal, René. *Mount Analogue*. New York, NY: The Overlook Press, 1972.

The Dawn Wall. Amazon Prime Video, 2017. https://www.amazon.com/Dawn-Wall-Tommy-Caldwell/dp/B07K6ZG7P2/ref=sr_1_1?crid=2O5940OKTBKCH&dchild=1&keywords=the+dawn+wall&qid=1619220050&s=instant-video&sprefix=the+dawn+wall%2Caps%2C255&sr=1-1.

Dawn, Stefani. "Don't Take Granite for Granite." COMMON CLIMBER. Accessed April 28, 2021. https://www.commonclimber.com/granite.html.

Dee, Catherine. *Form and Fabric in Landscape Architecture: a Visual Introduction*. New York, NY: Routledge, 2013.

Dee, Catherine. "'The Imaginary Texture of the Real ...' Critical Visual Studies in Landscape Architecture: Contexts, Foundations and Approaches." Landscape Research 29, no. 1 (2004): 13–30. https://doi.org/10.1080/0142639032000172424.

"Design." Maggie Daley Park. Chicago Park District. Accessed May 2, 2021. https://maggiedaleypark.com/about/design/.

Eberhardt, Danny. "Don't Take It for Granite: Understanding Different Rock Types for Climbing." Moja Gear, March 7, 2016. https://mojagear.com/dont-take-it-for-granite/.

Editors, The. "The 25 Greatest Moments in Yosemite Climbing History." Outside Online, June 1, 2016. https://www.outsideonline.com/2075501/25-greatest-moments-yosemite-climbing-history.

FinalSwitchBack. "Half Dome Art Yosemite Painting Print Illustration." Etsy. Accessed May 10, 2021. https://www.etsy.com/listing/641714642/half-dome-art-yosemite-painting-print?utm_source=Pinterest&utmmedium=PageTools&utm_campaign=Share&utm_term=so.lp.d2.v1&share_time=15146689962000&epik=dj0yJnU9ODN4NGNXQkxEamFKTXInSUFOTkNWZHc5dF9aNDBTMDQmcD0wJm4Q1RzTzB4YlNSb0NXRmwyU244YzJKQSZ0PUFBQUFBR0J0OG40.

Frohlich, Robert. "Kauk Loosens His Cape." Adventure Sports Journal, September 1, 2010. https://adventuresportsjournal.com/kauk-loosens-his-cape/.

Green, Stewart. "6 Tips to Assess Wet Rock Before Climbing." LiveAbout, March 17, 2017. https://www.liveabout.com/how-to-assess-wet-rock-before-climbing-756021#:~:text=Climb%20Granite%20and%20Metamorphic%20Rock%20after%20Rain&text=These%20rocks%20are%20hard%2C%20erosion,go%20climbing%20on%20granite%20cliffs.

"The History of Yosemite National Park." National Park Reservations, 2003. https://www.nationalparkreservations.com/article/yosemite-the-history-of-yosemite-national-park/.

Hittell, John S. *Yosemite; Its Wonders and Its Beauties.* San Francisco, CA: H.H. Bancroft & Co., 1868.

Holmes, Joey. "63 Useful Rock Climbing Terms Every Climber Should Know." Cool of the Wild. Accessed April 23, 2021. https://coolofthewild.com/rock-climbing-terms/.

Howard, Brian Clark. "Yosemite's Iconic El Capitan Mapped in High-Resolution 3D." National Geographic, June 13, 2013. https://www.nationalgeographic.com/science/article/130612-yosemite-el-capitan-rock-mapped.

"Husky Climbing Rock, Rock Climbing." theCrag. Accessed May 2, 2021. https://www.thecrag.com/en/climbing/united-states/washington/area/690389796.

"Inspiration Playground." ID Sculpture Custom Projects Gallery. Accessed May 2, 2021. https://idsculpture.com/projects.html.

Johnson, Julie, and Brooke Sullivan. Letter to LARCH 303. "Ecological Systems Studio Handouts." WA: Seattle, 2019.

Joseph III, Taylor E., and Joseph E. Taylor. *Pilgrims of the Vertical Yosemite Rock Climbers and Nature at Risk.* Cambridge, MA: Harvard University Press, 2011.

Kambo, Gurpree. "Scaling the Wall of Toxic Masculinity and Rediscovering Sports as an Adult." The Peak, September 25, 2020. https://the-peak.ca/2020/09/scaling-the-wall-of-toxic-masculinity-and-rediscovering-sports-as-an-adult/.

Kandula, Ikya. "Climbers Are Pushing Back on How Racist Climbing Routes Are Named." Condé Nast Traveler. Condé Nast Traveler, August 17, 2020. https://www.cntraveler.com/story/climbers-are-pushing-back-on-how-racist-climbing-routes-are-named.

King, Jason. "Representing Motion." Web log. *Landscape + Urbanism* (blog), January 1, 2010. http://landscapeandurbanism.blogspot.com/2009/01/representing-motion.html.

Krakauer, Jon. I*nto Thin Air: a Personal Account of the Mount Everest Disaster*. New York, NY: Anchor Books, 1997.

Kuelthau, Willis. "The Statistics Behind the Growth of Rock Climbing & Bouldering." 99Boulders, June 28, 2019. https://www.99boulders.com/the-growth-of-climbing.maggiedaleypark.com/about/design/.

Lam, Phoenix W., and David Graddol. "Conceptualising the Vertical Landscape: The Case of the International Finance Centre in the World's Most Vertical City." Journal of Sociolinguistics 21, no. 4 (September 11, 2017): 521–46. https://doi.org/10.1111/josl.12243.

"Maggie Daley Park." Michael Van Valkenburgh Associates, Inc. Accessed May 2, 2021. https://www.mvvainc.com/project.php?id=61&c=parks.

"Marymoor Park." Experience Redmond, March 29, 2018. https://experienceredmond.com/activities-and-attractions/marymoor-park/.

"Meeting Face-to-Face with El Capitan (Yosemite National Park, USA)." EurekAlert! Geological Society of America, July 23, 2015. https://www.eurekalert.org/pub_releases/2015-07/gsoa-mfw072315.php.

"Naming Conventions." the Crag. Accessed April 24, 2021. https://www.thecrag.com/en/article/namingpolicy.

National Park Service. "Yosemite Basics." n.d. Map. *Yosemite*.

"National Park System." National Parks Service. U.S. Department of the Interior. Accessed April 21, 2021. https://www.nps.gov/aboutus/national-park-system.htm.

"NPS Climbing History." National Parks Service. U.S. Department of the Interior, June 1, 2020. https://www.nps.gov/subjects/climbing/history.htm.

NPS. "Rock Climbing." National Parks Service. U.S. Department of the Interior. Accessed April 29, 2021. https://www.nps.gov/yose/planyourvisit/climbing.htm.

Orr, David W. Essay. In *Ecological Literacy: Education and the Transition to a Postmodern World*, 85–95. Albany, NY: State University of New York Press, 1992.

Parks, Jay. "Climbing and Bouldering Rating Systems." REI Co-op. Accessed April 23, 2021. https://www.rei.com/learn/expert-advice/climbing-bouldering-rating.html.

Paul. "5 Different Rock Types Found When Climbing Outside." Rock Climbing Central. Rock Climbing Central, April 22, 2020. https://rockclimbingcentral.com/5-different-rock-types-found-when-climbing-outside/.

Planetmountain. "Alex Honnold, Tommy Caldwell and the El Capitan Nose Speed Record Time-Lapse." PlanetMountain.com, May 7, 2020. https://www.planetmountain.com/en/news/climbing/alex-honnold-tommy-caldwell-el-capitan-nose-speed-record-time-lapse.html#:~:text=In%20June%202018%20American%20rock,into%20just%20over%20two%20minutes.

Porter, Libby. "Producing Forests: A Colonial Genealogy of Environmental Planning in Victoria, Australia." *Journal of Planning Education and Research* 26, no. 4 (2007): 466–77. https://doi.org/10.1177/0739456x07301170.

Pulkkinen, Levi. “Seattle Climbers Rally to Protect UW's Weirdest Rock.” seattlepi.com. Seattle Post-Intelligencer, November 15, 2016. https://www.seattlepi.com/seattlenews/article/Seattle-climbers-rally-to-protect-UW-s-weirdest-10617317.php#photo-11811518.

Reid, Grant W. *Landscape Graphics: Plan, Section, and Perspective Drawing of Landscape Spaces*. New York, NY: Watson-Guptill Publications, 2002.

Rickly, Jillian M. “Cultural Geographies.” Essay. In *Cultural Geographies* 24, 24:69–85. 1. London, UK: SAGE, 2017.

“Rock Climbing Guides: Routes, Photos & Forum.” Mountain Project. Accessed April 27, 2021. https://www.mountainproject.com/.

“Rock Climbing.” National Parks Service. U.S. Department of the Interior. Accessed April 23, 2021. https://www.nps.gov/yose/planyourvisit/climbing.htm.

Ron Kauk - Mindfulness and Climbing. *Snow Creek Consort*, 2017. https://www.youtube.com/watch?v=r0K8pBrOdis.

“Route Building 101: A How-To Guide.” TAWKROC. Accessed April 23, 2021. https://tawkroc.org/bolting-reimbursement/route-building-101/.

Sbarra, BJ. “What It Takes To Develop A New Climbing Route.” REI Co-op Journal, May 22, 2020. https://www.rei.com/blog/climb/what-it-takes-to-develop-a-new-climbing-route.

SGB, Media. “American Alpine Club Report Reveals Climbing's Powerful Impact.” SGB Media Online, July 11, 2019. https://sgbonline.com/study-reveals-climbings-powerful-impact/.

Sloan, Erik, and Marek Jakubowski. *Rock Climbing Yosemite Valley: 750 Best Free Routes*. Mariposa, CA: Yosemite Bigwalls, 2020.

Spence, Mark. “Dispossesing the Wilderness: Yosemite Indians and the National Park Ideal, 1864-1930.” *Pacific Historical Review* 65, no. 1 (January 1996): 27–59. https://doi.org/10.2307/3640826.

Stevens, Wallace. *The Collected Poems of Wallace Stevens*. New York, NY: Alfred A. Knopf, 1954.

Tribune Wire Reports. “2 Americans Complete 'World's Most Difficult' Rock Climb at Yosemite.” Chicago Tribune, January 14, 2015. https://www.chicagotribune.com/nation-world/chi-el-capitan-climb--20150114-story.html.

Valley Uprising. Amazon Prime Video. United States: Sender Films, 2014. https://www.amazon.com/Valley-Uprising-Peter-Sarsgaard/dp/B01M3UPOWI/ref=sr_1_1?crid=26EQET27ODTN1&dchild=1&keywords=valley+uprising&qid=1619025572&sprefix=valley+uprising%2Caps%2C304&sr=8-1.

Watch The National Parks: America's Best Idea. PBS. Public Broadcasting Service, 2009. https://www.pbs.org/kenburns/the-national-parks/#645.

Wilkinson, Freddie. "Rock Climbing: from Ancient Practice to Olympic Sport." National Geographic, March 14, 2019. https://www.nationalgeographic.com/adventure/article/rock-climbing.

Woland, Jake, Steven Strom, and Kurt Nathan. *Site Engineering for Landscape Architects*. 6th ed. Hoboken, NJ: John Wiley & Sons, Inc., 2013.

"Yosemite Climbing History." Touchstone Climbing, October 7, 2014. https://touchstoneclimbing.com/yosemite-climbing-history/.

"Yosemite Climbing Info - Everything You Need to Know About Rock Climbing in Yosemite." SuperTopo. Accessed April 28, 2021. http://www.supertopo.com/climbingareas/yosemite.html.

Zobs, Andris, and Ian Glas. "Climbing in Playgrounds." The Field. ASLA, March 3, 2015. https://thefield.asla.org/2015/03/03/climbing-in-playgrounds/.

"'13 Ways of Looking at a Blackbird.'" Bolstered By Thoughts, November 17, 2015. https://bolsteredbythoughts.weebly.com/blog/13-ways-of-looking-at-a-blackbird.