I, Andrew D McCarthy, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture (Master of).

It is entitled:
Villa Prelat: A Sustainable Dwelling in the Argentine Savanna

Student's name: Andrew D McCarthy

This work and its defense approved by:

Committee chair: Jeffrey Tilman, PhD
Committee member: John Eliot Hancock, MARCH
Villa Prelat
A Sustainable Dwelling in the Argentine Savanna

A thesis submitted to the
Graduate School
of the University of Cincinnati
in partial fulfillment of the
requirements for the degree of

Master of Architecture

in the School of Architecture and Interior Design
of the College of Design, Architecture, Art, and Planning

by

Andrew D. McCarthy

B.A. University of Texas at Austin
2012

Committee Chair: Jeffrey Tilman, Ph.D.
Committee Member: John Eliot Hancock, MARCH
The clients, Katherine and Alfredo Prelat, plan to build a new home on a tract of land in the Argentine savanna, in a province called Entre Ríos. They seek a design for a country home with a horse barn and extensive gardens. This villa will be off the grid and must incorporate sustainable architecture.

The design for the Villa Prelat emerged from five fundamental considerations:

- clients’ focus on sustainability
- architectural theory of Critical Regionalism
- villa typology
- features of the site
- program for the villa

In discussions with the client, it became clear that they were not only interested in sustainability, they wanted to create a model of sustainability for Entre Ríos. They noted that the movement toward “green technology” has been slow to reach this area, and they wanted an ecologically sensitive dwelling that could serve as an example for the surrounding community. Second, Critical Regionalism was determined to be a fitting theoretical underpinning for this project. Third, the villa typology was deemed a highly suitable vehicle for sustainability goals because it responds to regional characteristics and integrates with the estancia typology found in Argentina. Fourth, the physical characteristics of the site were a dominant factor in the design. Design principles were distilled from specific aspects of the region and landscape. Site factors such as climate, wind patterns, and soil conditions were integral to design decisions. Last, the program of the Villa Prelat was developed, in part, to meet a primary goal of the clients; to foster and support familial and social relationships.

Following discussions with the designer, the clients embraced the concept of a contemporary villa. The core of the theoretical approach to ecological design was derived from the people, landscape, climate, and architectural tradition of Entre Ríos.

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Sustainability culture emphasizes social equality, community stewardship, compassion for all living things, renewal of habitat, and local sustenance. “The effective power of sustainability culture, however, is not always affirmative. It can take on a more conservative and reactive flavor when used to discipline everyday life.” This may appear extreme in terms of the sacrifice of beloved modern creature comforts. To achieve the goals of both ecological design and leisure, the sustainable program cannot be so arduous that the aspirations of the villa are altogether forsaken. For the sustainability culture to sustain itself, it must make reasonable accommodations to support the clients’ current standard of living.

What the clients wish to gain from sustainable architecture is, in large part, freedom from dependence on “the grid.” They desire to live within a contained ecological system that encompasses “water, energy, food resources, and waste absorption.” Autonomous architecture, according to Le Corbusier, is independent from the cultural context. Modernist architecture sidestepped thousands of years of architectural tradition to propel modern man into the future. Paul Ricoeur asks, “In order to get on to the road toward modernization, is it necessary to jettison the old cultural past which has been the raison d’être of a nation?” What is proposed in this project is the acquisition of autonomy through integration. Furthermore, “green” architecture must use resources frugally and responsibly in order to minimize harm to the global environment. This goal can be achieved by observing the traditional wisdom of regional building, and applying that wisdom to the culture that has evolved beyond those traditions.

1 Parr, 2009, p. 6
2 Head, p. 12
3 Parr, 2010, p. 235
4 Rampton, p. 268

Figure 3. Aluminum alloy coating evacuated tube solar collector
The Back-to-the-Earth Movement that began in the 1960s in the United States is still active in areas of California, Arizona, and New Mexico. This movement is a reaction to several historical trends; being the Industrial Revolution and its homogenization of culture, another trend being the influx of people to the cities from the country, and then sprawling back into the country, and a third trend is the continual degradation of the environment. Paolo Soleri, the creator of Arcosanti, is the architect who has propelled the success of earthships. The earthships are closed-system buildings that have little to no impact on the health of the environment. Much of the materials used are recyclables like old tires and cans. The designers of these structures embrace the technological aesthetic, although their work belies industrial origins. The client attended one of Soleri’s lectures in the late sixties, and was especially interested
in the solutions to anti-suburban sprawl. Although Soleri’s success waned in those following decades, earthships continue to proliferate in the desert. Industrialization has led to the rapid expansion of wasteful, high-maintenance human settlement. If industrial components are thoughtfully repurposed after they are no longer needed for their original design, they can last hundreds of years in sustainable construction. We can recycle the throw-away culture of the West into a culture of responsible consumption.

Machine parts have long been banished into soffits and behind plastered lath, but there are also designers who expose the ducts and pipes and electrical infrastructure. Besides the inherent honesty of the modernist approach of the technologic aesthetic, another reason to expose modern machinery is because it often has its own sculptural beauty. Glass, steel, concrete, and photovoltaic cells are often used for strictly practical purposes, yet they can also be treated in ways that reveal their aesthetic qualities.

The Industrial Revolution laid the groundwork for a technological revolution in the twentieth century. Technology can have value beyond its practicality in its beauty of design. Architects have made it legible in their designs as a "technology transfer." According to philosopher Herbert Marcuse, “when technics becomes the universal form of material production, it circumscribes an entire culture, it projects a historic totality—a ‘world’. ” This means that technology can also make cultural wisdom obsolete. William McDonough promotes “a balance between the local and the global, traditional settlements and the emerging planetary culture.” Modern technology often requires expert knowledge to fix malfunctions, can be expensive to replace, and is not as time-tested as vernacular solutions.

5 Parr, 2010, p. 112
6 Marcuse, p. 154
7 McDonough, p. 32
According to Shannon May, “it is no longer possible for human beings as individuals... to know how to live sustainably.” Critical regionalism can be applied to architectural design to revive cultural knowledge acquired over generations.

To be truly autonomous, the Villa Prelat must be able to be controlled and adapted by the clients, to the point that very little specialized servicing will be needed. The moving parts of turbines, as opposed to the stationary cells of photovoltaic panels, make them likely to require more frequent maintenance, and are therefore less desirable sources of energy in an autonomous dwelling. Bifacial solar panels collect solar energy while providing shade. They reduce direct solar gain passing through the vertical and horizontal windows beneath, and do not restrict roof ventilation, which cools the panels themselves, making them operate more efficiently. Appalachian State University used this translucent device in their Solar Homestead. In addition to performing as a floating collector-canopy, the same technology can be used as solar collector skylights. They baffle direct sunlight into a pattern on the floor surfaces below, while collecting energy.
The dominant theoretical discourse behind the Villa Prelat is Critical Regionalism, which fulfills the clients’ requirement of sustainability. Critical regionalist architecture can be based on regional history, materials, construction, and many other cultural aspects. Accordingly, one of the major principles of sustainability is to utilize local resources.

In a region that has been traversed by a panoply of European nationalities, a unifying cultural expression could strengthen the society of Entre Ríos. In addition to environmental sustainability, cultural and economic sustainability are integral to a healthy ecology. Critical Regionalism is a vehicle for synthesizing multiple cultural influences while promoting local labor and ecological design. A critical regionalist approach to the design of a sustainable dwelling/agricultural complex involves the exploitation of cultural resources. The
Critical regionalism is a process of establishing a new cultural identity that respects the past but moves toward an architecture of societal evolution. Frampton has stated that “architecture can only be sustained today as a critical practice if it assumes an arrière-garde position, that is to say, one which distances itself equally from the Enlightenment myth of progress and from a reactionary, unrealistic impulse to return to the architectonic forms of the pre-industrial past.”

Critical Regionalism was coined by Alexander Tzonis and Liane Lefaivre in a 1981 essay titled The Grid and the Pathway. Critical regionalism differs from regionalism in that the theory is not connected to populism or nationalism. Instead, the critical investigations, in the Kantian tradition, lead to different perceptions of the region and its culture. The success of critical regionalism could possibly be linked to the cynicism in contemporary culture. Many people are now looking at history with a fresh perspective, and understanding their own culture as familiar but also in some ways new. The explicitly communicative aspect of Regionalism does not always respond to generational change because it leaves little room for varied interpretation. Tzonis and LeFaiivre proposed defamiliarization, which identifies, decomposes, then recomposes vernacular elements.

Vittorio Gregotti is an Italian architect who has applied critical regionalism theory to several of his projects. A notable work of architecture is the Belém Cultural Center in Lisbon, with an entry tower reminiscent of the Tower of Belém, a fortified lighthouse. For Gregotti, the earth is a scrapbook of vestigial history. The history of the site for the Villa Prelat is
little-known, however, it could be assumed that prior to agriculture the land was espinal savanna. The land was most likely converted into open pasture once cattle were introduced to the country. Later on the site was platted, fenced, and cultivated.

The spirit underlying Gregotti’s approach to critical regionalism is “an awareness of being part of a preexisting whole, of changing one part of a system to transform the whole,” which he calls modification. To modify the site in Rocamora, it is possible to further subdivide the rectangular piece of land into human-scale segments. Gregotti believes that architects must “modify, redouble, measure, situate, and utilize the landscape in order to know and meet the environment as a geographical totality of concrete things which are inseparable from their historical organization.” By modifying the site, the pre-existing architecture shows through.

Kenneth Frampton places a premium on local materials, local labor, the quality of natural light and the uniqueness of climate. For him it is more important to craft an experience than an object; to design a thread in the cultural fabric. Like Tzonis and LeFaivre, Frampton makes the distinction between vernacular regionalism and critical regionalism. According to Frampton, “the fundamental strategy of Critical Regionalism is to mediate the impact of universal civilization with the elements derived indirectly from the peculiarities of a particular place.”

The site must be the point of departure. The site of the Villa Prelat may seem void of peculiarity, but the 100-acre parcel and the region surrounding it is laden with inspiration. The de-automatization of architecture pricks the consciousness of regional inhabitants, instead of lulling people into accepting any global influence.

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2 Gregotti, p. 340
3 Frampton
The Equestrian, the Gaucho, and the Milonguera (Tango dancer) are stock characters of the national identity of Argentina. Based on their distinctive personae, the intensity of their pursuits, and their symbolic associations, these three iconic images of Argentina are used as inspiration for the design of the Villa Prelat.

Equestrian

The equestrian culture of Argentina is one of the strongest in the world. Boys growing up in the country play polo as soon as they learn to ride. The majority of top-ranked players in the world are from Argentina. Argentina became a polo mecca in the 1900s after British settlers to the Pampa imported the tradition. David Shennan was the first to conduct a formal polo match in Argentina in 1875. The Argentinian Olympic team won the gold medal in the 1924 games in Paris, and again in Berlin’s 1936 games. In 1918 Emilio Solanet created a studbook that established the pure-bred criollos registry. The Argentine Criollo, the offspring of Criollo mares and Thoroughbred stags, was the first official national breed. Due to breeding conformation the Argentine Criollo’s frame and musculature make it one of the hardiest yet fastest breeds in the world.

In increasing order of speed, horses tend to walk, trot, canter with three hoof beats, and finally gallop with four beats. From corner to corner, the distance across the site is 3,100 feet. This is a ten minute walk for a Criollo that could also gallop across the site in just under a minute. The average height and reasonably fit middle aged person walks at a comfortable pace of approximately 4.5 feet a second. From dwelling to barn is a 1.5 minute walk, and a 7 minute walk from the dwelling to the villa gate. By automobile, at 25 mph, it takes just under a minute to reach the dwelling from the gate; 1 minute and 40
seconds from the county road intersection and view corridor; and 2.5 minutes after passing the gallery forest of the Arroyo Calá (when the mirador can be seen across the soy fields.)

The barn is located 400 feet from the dwelling, a distance that mitigates dirt and odor while allowing reasonable back-and-forth trips throughout the day. A forsythia pergola connects the cross axis of the dwelling with the barn. The barn is equipped with solar hot water heaters and ample storage space to minimize the cumbersome movement of supplies. The barn lies due west, and downwind, from the dwelling. The equine pool lies at the crux of the entry axis. Between the barn and dwelling are a small equine garden and paddock. Surrounding the barn is also a training area and stomping ground. From the rooftop terrace there are wide vistas of equine activity.

Gaucho

The gauchos are an endangered class of Argentinian cattlemen who have been mythologized in literature and song. They roamed the Southern Cone plain when large tracts of land were owned by few people. The gauchos lived a spartan lifestyle, and survived on a diet of roasted meat and yerba maté. They were invigorated by the heat of the sun, the ocean of golden grass, and the conquest of the eternal horizon. The gauchos were the kings of the Pampa. The 18th century was a period of ruthless attacks on cattle herds, on Indian tribes, and on uninitiated immigrants. The gauchos thrived during the Age of Hides when they practiced what was known as cattle mining. They would use the lasso, bola, and knife to attack grazing cows by severing the tendons of their hind legs. The fabled gaucho class became a source of nationalistic symbolism in the late 19th century. They had their own bardic tradition that was discovered by poets and novelists, who mythologized their oral accounts.
The Villa Prelat will cultivate an *arquitectura gauchesca* that responds to this tradition. Of anonymous architecture, Bernard Rudofsky said that “the shapes of the houses, sometimes transmitted through a hundred generations, seem eternally valid, like those of their tools.” If valid tools produce valid form, then the characteristic bola, knife, and lasso of the gaucho would have created cleaved, carved, and tensile forms. The gauchos were nomadic, and because they lived during the Age of the Hide, the appropriate equipment for building would have been the blade, and the material would be tanned leather and vellum. Their buildings could have literally been *hidebound*, which would have also figuratively reflected their adherence to tradition and resistance to change. Few gauchos adapted to the commodification of the landscape because of their hard-line approach to tradition. Prosperity seems delicate in a country that has seen great upheaval in the economy and government, and this can lead to cultural rigidity. The clients, however, wish to reinvigorate the sense of freedom that the gaucho experienced at one time.
Milonguera

Salon Tango is a dance that originated in Argentina, but is now practiced around the world. Tango is a major Argentinean cultural symbol known for slow, measured, and smooth dance forms. The structure of Tango is a counterclockwise line-of-dance occurring at the periphery of a dance floor. To leave the lanes, and cut across the middle of the dance floor would be considered bad form. Tango is based on respect for the space of other dancers on the floor. There are precise códigos that describe the menu of embraces, flourishes, and walks. Walking systems, where the feet glide across the floor without shuffling, are very important to Tango. Walking occupies the majority of the dance. A contrapaso, or contra-step, changes the rhythm of the dance.

The previous examples of Argentinean staples of tradition can be used to formulate design principles in critical regionalist architecture. The importance of stability in the breeding of the criollo, to the pattern of hoof beats, to the pattern of tango figures, inform the cultural trajectory.
The formal vocabulary of Argentinean culture varies in purpose and origin. Some configurations react to the weather while others are based on the defense of territory. Some designs are purely the result of economic forces, while others respond to the topography.

Estancia

The estancia typology was conceived as a defensible dwelling, typically a single-story blockhouse with a mirador to watch the horizon, as well as porches with broad verandas/galleries that served as semi-private spaces to enjoy shade and breeze. This fortress-estancia type is very different from the Neo-Palladian estancia that followed. Before wire fencing
divided the Argentine landscape in the 1860s, dry moats reaching 12’ in depth and 25’ wide, surrounded the estancias. The omnipresent fence began the end of frontier conflicts between Indians, gauchos, and immigrants. After the 1880s there was no need to fortify one’s dwelling and farm. Although the estancias are relics of the past, they can inform the design of future agricultural dwellings in the countryside.

Silo

Silos are a familiar sight in rural Argentina, and are associated with the farm. Outside of a farm setting a silo could be a granary like the ones at the port of Buenos Aires, or a donjon of a Spanish castle, or an elevator shaft, or a substantial column. The hollow cylinder could be interpreted as functioning in many ways, especially when bundled or merged together. Erich Mendelsohn wrote this of the industrial architecture of Buffalo, New York:

“Mountainous silos, incredibly space-conscious, but creating space. A random confusion amidst the chaos of loading and unloading corn ships, of railways and bridges, crane monsters with live gestures, hordes of silo cells in concrete, stone and glazed brick. Then suddenly a silo with administrative buildings, closed horizontal fronts against the stupendous verticals of fifty to a hundred cylinders, and all this in the sharp evening light. I took photographs like mad. Everything else so far now seemed to have been shaped interim to my silo dreams.”

Buenos Aires was a city that took form around the turn of the 20th century, with a sophisticated port and beaux arts towers. Along the port was an industrial city built for freighters. The silhouette of the port of Buenos Aires was an important inspiration for Le Corbusier’s designs for the plan of the city.
Lateral wind loads, convective cooling, air exchange, and possibly wind-generated energy, all have an impact on the design of the Villa Prelat. The main reason for positioning the dwelling in the crook of the double-legged windbreak is practical—to provide respite in a windswept plain.

The main vertical element of the villa, the mirador, will be designed to resist the intense wind load. The mirador has an increased lateral load compared to the other two axes because it is twice as tall. This results in the possibility of reentrant corners. The gauchesque stretched hide tectonic could provide tensile structure while also acting as a canopy on the rooftop terrace. Corten steel, similar in appearance to worn leather, has been utilized many times for sculptural installation by Richard Serra. Just outside the Fort Worth Museum of Modern Art stands a tulip-shaped tower called Vortex. The interior of the sculpture is a tall room with an oculus at the top similar to Peter Zumthor’s Brüder Klaus Chapel. The goal for energy efficient architecture is to exploit the prevalent environmental forces. The form of the mirador will facilitate the movement of prevailing winds through the interior of the dwelling to replace polluted air, and convectively cool the interior with jacaranda-scented air.

Kenneth Frampton stated that the “essence of such a space/place depends upon the concrete, clearly defined nature of its boundary.” The parti of Villa Prelat is a protective bracket, and the nature of its boundaries centers on refuge. “A boundary is not that at which something stops, but, as the Greeks recognized, the boundary is that from which something begins its presencing.” The natural boundaries on the site in the form of windbreaks were the starting point of the design for the villa.

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3 Heidegger.
The two sylvan walls surrounding the dwelling constitute tall, protective poplars. The columnar poplars of the windbreak appear as the ruins of a Greek temple. To reinforce the sense of refuge and privacy provided by the windbreak, and to transition the scale of the poplars to the jacarandas, understory trees and shrubs will be planted in rows parallel the windbreak.

Windbreaks, also known as shelterbelts, are primarily used to prevent soil erosion in Entre Ríos. The site of the Villa Prelat currently has existing poplar-lined roads, axes, and fields. The windbreak at the center of the site has two legs because prevailing winds come from the north, east, and south. Placing the dwelling within a mature windbreak will reduce the winter wind velocity and air infiltration, thereby reducing heating loads. In the summer, the evaporation of the Jacaranda Court runnels and permeable pavers will be reduced. An equine windbreak, or living barn, also two-legged, will have one leg blocking western sunlight and one leg blocking dust and odor from reaching the dwelling. The equine shelterbelt may also reduce the amount of feed needed during winter.

Gallery Forest

A gallery forest, or riparian corridor, is a grouping of trees that cling to the banks of a creek in a grassy plain. It is like an elongated oasis forming a natural, although crooked, allée. A pergola, or vine-covered walk, is similar to a gallery forest because it is often composed of dense foliage in a grassy landscape. It can also be crooked, like the one at Hill House in Hampstead Heath, just north of London. Designed by Thomas Hayton Mawson, the entire pergola length is 850', with the shortest segment at 100' and the longest at 250'. The width of the pergola is 10', with the nodes between segments at 25'x25'.
The size and trajectory of a pergola is highly variable. The pergola of Edwin Lutyens’s Hestercombe is 250’ long and twelve feet wide. It is a straight line at the far edge of the garden, connecting one corner with the other, 250’ away and parallel to the house. The pergola differs most obviously from the gallery forest in its envelopment of a footpath, not a river. A pergola provides exercise under a controlled environment of dappled light and rigorous training and maintenance of vines. A long gallery can be considered an interior representation of the gallery forest and pergola. The Hardwick Hall gallery is 20’ wide and 170’ long. It was also used for recreation (in the winter) and brought in much more light in the winter than many other rooms in the house.

Woodlots can be used as windbreaks as well as sources of fuel. A large part of the ample acreage of the site will be planted with trees that will benefit both the villa and the region. Block-plantings yield traditional wood products that can be used as fuel on site or sold. An acre of block-planting can contain about 400 trees. Planting a mosaic of small blocks of at least three tree varieties promotes the genetic diversity of wildlife, and mitigates the devastation of pest attacks. Biomass, as a fuel, is carbon neutral because the same amount of carbon dioxide released through biodegradation would occur by burning the wood for energy.

Poplar trees are often used for phytoremediation—cleaning the soil, water, and air with vegetation. These trees have deep roots upon which beneficial microbes and fungi live, and digest soil contaminants including harsh fertilizers, pesticides, metals, and petroleum products. Poplars will be placed around the barn and the leach field to filter the pollutants that have seeped into the ground. Poplar leaves also contain high levels of nitrogen and protein, and can therefore be used for horse feedstock.
Frank Lloyd Wright was able to exalt the properties of flat prairie by counterbalancing vertical elements with horizontality, and stretching a composition the way the fields are stretched to the horizon. He also availed himself of local stone and wood, and landscaped the buildings to the prairie. There are often Native American motifs found in building details, further attempting to relate the architecture to the region. The heaviness of the Prairie Style mirrors the thick, stratiﬁed, settled, stable earth below. The main site strategy for Villa Prelat is to cultivate what Walter Gropius called the “Aesthetic of the Horizontal.” The datum of landscape should melt into peripheral vision. Through appropriation of landscape features the cadastral limits can be opened by repeating adjacent site geometries, such as the row of 280’x35’ greenhouses on the parcel of land to the west.

In Piet Mondrian’s paintings, there is no perceptual boundary. His compositions consist of linework that stretches inﬁnitely, with solid colors ﬁlling in parts of the grid. The vertical elements in Mondrian’s paintings represent man-made objects like windmills, lighthouses, steeples, or they just represent a man standing. The horizontal lines represent the flatness of the earth. Static, low landscapes such as the Dutch countryside are more affected by vertical elements than topographies of variable elevation.
The following projects were designed by Argentinean architects using critical regionalist approaches to evoke the history, terrain, and lifestyle of Argentina.

**Mirador-inspired Houses**

The *House in Calamuchita* reinterprets the defensive lookout tower, known as a *mirador,* (pronounced like a Bostonian saying “mirror-door”) as a place to admire the view of the terrain. Architect Miguelangel Roca completed the project in 2004. The mirador is the anchor of the project, wrapped in a glass-enclosed staircase on all four sides for a 360 degree survey of the property as one ascends from main living space to office, to master bedroom, and finally to rooftop terrace. The opening at the top of the tower faces away from direction of prevailing winds so that negative pressure can pull warm air out of the main living space.
The single vertical axis of the mirador in juxtaposition to the two horizontal axes of the north and south wings, anchors the villa to the site as a dynamic presence in a static landscape. As the Argentinean president Domingo Faustino Sarmiento once said:

“The plains, the woods, the rivers are all immense; and the horizon is always undefined... making it difficult to tell where the land ends and the sky begins.”

Argentinian architect Leopoldo Laguingue designed the *House in Córdoba* to reflect the embodied immensity of the featureless plain. The house echoes the elevators, mills, silos, and warehouses that punctuate an infinite datum in Le Corbusier’s sketches of the port of Buenos Aires. Laguingue pierces the silhouette of the landscape with a water tower, as a thick concrete roof stabilizes the vastness and immeasurable scale of the terrain.
The long gallery was a programmatic function of British country houses, derived from the desire to exercise in a decorous manner, especially on cold and wet days. The Argentinian porch/portico/loggia functions as the convivial semi-public, semi-private component of a dwelling. Situated between the indoors and outdoors, it was absolutely essential in Argentina prior to the advent of mechanical air conditioning. The Villa Prelat merges the two traditions for convective cooling purposes as well as leisurely fitness.

The primary circulation between upper and lower levels at House R is a dual-flight ramp that extends into a portico. Argentinian architect Clorindo Testa made the traditional portico an accessibility feature of the house. The distance traveled...
from the first to second floor could be abridged by a staircase, thereby decreasing the length of time taken to ascend ten feet or so. Regardless of the practicality of the ramp/portico in terms of disabled access, the comfort and spatial experience is enhanced by this new take on the long gallery type. At the time House R was being designed, around 2000, Testa considered Argentina to be a third world country. This country has experienced great swings in prosperity since its independence in the early 1800s. Political and economic crises have been common, yet the people take misfortune in stride. The portico symbolizes the guarded yet open nature of society, and the languid pace of life in Argentina.

The Long Gallery House, designed by Argentinian architect Cesar Pelli, is a hypothetical dwelling with a central spine connecting various program. “It changes in character as one proceeds,” first a front door, then a vista, then reception area, then breezeway, then center space, then porch, then colonnade. It is a chain that can be lengthened and further ornamented with any future programmatic needs. Although bounded to a single axis, the Long Gallery House is built on endless surplus and variation. It is complete yet open-ended. “It is in some ways like embracing the porches of my native Argentina, used for everything at all times—entrance, circulation, play, dining, even occasionally sleeping,” said Pelli.

The northern porch acts as a Summer Long Gallery because it faces south, away from the equatorial sun. The southern porch is the Winter Long Gallery. An attached sunspace on the north facade of the Villa Prelat is used in the winter for passive solar heating. The terraced solarium links the main floor to the basement with a ramp, while also allowing a great deal of light and heat inside during the winter.
The gestalt of the Villa Prelat is familiar yet curious to the people of the region. Although argentinean vernacular form is used to anchor the villa to the site, a design perspective using critical regionalism emphasizes the autonomous aspect of the project as a change agent in the region. Kenneth Frampton stated that “the primary principle of architectural autonomy resides in the tectonic rather than the scenographic.” The Modernist idiom can be used to engage new architecture with its environment and society. The Villa Prelat is embedded in the cultural landscape, but the way it interacts with the site and within the rural community reveals its purpose. The romantic imagery often associated with a villa does not comport with the practical landscape, or cultural ambitions, of Entre Ríos. The durable materials, well-proportioned space, and abundant nature light more closely reference the regional character. The

Figure 43. Duchamp’s Fountain
Figure 43. Martin Maurer’s Big Duck
Figure 43. Johnson’s Glass House
meaning of country home, traditional frontier residence, and sustainable household are all layered onto the landscape. This architectural intervention is just another chapter in the story of this site and region.

The Semperian plinth is connected to the earth, and is made of massive components, but supports and follows the logic of the frame above. The plinth of the Casa de Blas is not only habitable space, but it constitutes the majority of the living spaces. It gives privacy to the residents but also obfuscates the servant spaces of the home. The glass pavilion above admits natural light from all directions, and showcases elevated views of the romantic countryside.

The Villa Prelat is set on a plinth 2.5’ above grade to counteract rising damp and to allow breezes to pass beneath the structure. Polished concrete steps project from the south elevation to welcome guests.
Although architectural framing elements primarily influence a building’s structure, they also suggest internal and external divisions. Villa Stein de Monzie at Garches is another Corbusian villa that Colin Rowe compared to a work of Palladio—in this case the Villa Foscari. The modern invention of extruded steel allowed for variations in the plans of each floor in Villa Stein, as well as greater sectional variation. Villa Stein and Villa Foscari are essentially blocks of equal dimension. Whereas Corbusier was able to push and pull the exterior and interior surfaces of the mass, Palladio’s approach was more akin to the reductive carving of a plaster mold. Villa Stein has a hollow core for the main gathering space, but the majority of programmed spaces are on the perimeter. The de-emphasis of the center creates tension in the extremities, whereas the stability of Palladian organization is defined by the regular structural grid.
The Villa Tugendhat’s glacial enclosing membrane makes the dwelling seem barrier-less. The open floor plan allows for loose enclosure of the interior partitions. The traditional language of spatial separation is replaced with a suggestion of division. The marble and exotic lumber interior membranes are thin and cornerless. The entire structure seems too delicate to inhabit any other way than carefully and calmly.

The Japanese version of the Aristotelian elements, called the go dai (five great,) include the void as the fifth element. The U-House was designed by Toyo Ito on behalf of his sister to commemorate the passing of her husband. The layout of the house is based on the peripheric principle, symbolizing the presence of the late husband. The interior courtyard, the memorial void, is objectified, making it a defined externality from oneself. John Hancock defines the word object as “a thing
out there on its own in the physical world and presented for our examination.” The tablelands of Entre Ríos are objectified as an infinite void with periodic interruptions.

A hearth is traditionally a setting for fire and heat and discourse and nourishment. The figurative hearth at the center of the Villa Prelat is not an oasis of warmth since there is plenty of warmth in the region. The heat and activity occurs on the edge of the dwelling but the center stays cool and serene. The emptiness, fullness, and dynamic ghost of the Jacaranda Courtyard make it a proper hearth. The boughs of the trees will paint the ground with purple blossoms, and seasonal foliage variations will both transmit light and obscure light.

The exterior form of the villa can be understood as three elongated glass volumes that are encased in concrete, surrounding a purple cloud that is bracketed on the other two sides by towering trees.
Institution

The villa typology meets the goals of ecological design in three primary ways. The traditional villa celebrates the natural surroundings with framed views, landscaping, alignment with prevailing winds, and other means. The villa embraces nature by extending the boundaries of the living spaces to the outdoors. The different parts of the villa necessitate movement between the interior and outdoors, and a fluidity between the parts develops. For the clients to enmesh themselves in Argentinean culture they would be expected to participate in large outdoor gatherings and informal dining. Villas have also traditionally been designed with the intention of sustaining a hereditary legacy by accommodating multi-generational occupancy. Most importantly, the villa originated as a self-sustaining typology to nourish the inhabitants, and to store surplus goods.
This project repositions the villa in a 21st century context. The term *villa* has had various meanings among different time periods, languages, and locations. The Villa Prelat is a retreat—a secondary residence in the country, with an agricultural component. The words *ecology* and *villa* derive from the same root word—*oikos*, which means house in Greek. The *oi* diphthong that English-speakers associate as rhyming with toy, was often pronounced *eye* like tea, or pronounced with the *wi* sound like the word will. The Proto-Indo-European origin of the word villa is *weik*, which meant clan. Oikos was appropriated into Latin as *vicus*, and the meaning evolved from a single house to a row of houses. In Late Antiquity a diminutive form of vicus, the word *vill*, eventually became *villa*, which took on the meaning of estate. “In general the Latin word *villa* connotes a house in the country, built on a sizable plot of land and often intended by its wealthy owners as a seasonal, part-time habitation,”1 according to Pierre de la Ruffinière du Prey. In twentieth century Britain, a villa came to be understood as a house, often semi-detached, for a middle class nuclear family. The democratization and overextension of the term lessened its cachet and led it into disuse. In Brazil, the word *vila* evolved into ironic slang for a low class residential area. In Argentinian Spanish, *villa* can fit the English definition, or it can denote a small town. The closest Argentinian equivalent of a villa is an *estancia*, except this building type is a permanent residence with a primary focus on agriculture. A *finca* is a farmhouse or cottage, and does not evoke luxurious accommodations. A *rancho* is a livestock operation, and also unfit to describe the qualities of the building. To call this project the Casa Prelat or *la Residencia Prelat* would be too general because it could mean house, apartment, mansion, etc.

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1 Prey, p. 12

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Figure 55. Getty Villa. Langdon and Wilson. 1974
Inspired by the Villa dei Papyri in Herculaneum
The institution of the villa originated as a response to the congested streets, foul air, and tainted water of ancient Mediterranean cities. Prosperous citizens desired to leave the urban morass and find pristine nature at nearby seaside cliffs. The villa was an ideal institution for the bourgeoisie to escape the microcosm of social and political frenzy, as well as the microclimate of polluted city air, and enjoy an unencumbered lifestyle in the rural wilderness.

Should the region surrounding the site regain its industrial economy, it would in turn attract workers from the countryside. The growing urban area and subsequent urban sprawl could be contained by sizable, sustainable and well-integrated villas just outside the city, like the Villa Prelat. This would help contain the urban area and concentrate sustainable activity.
“Solitude. Only in intimate communion with solitude may man find himself. Solitude is good company and my architecture is not for those who fear or shun it.”

* Luis Barragán

The formal qualities, scale, and feeling of the Villa Prelat are influenced by residential projects of the Mexican architect Luis Barragan. His architecture removes the inhabitants from the environment, and creates an inner-world within brightly painted walls.

Escaping urban congestion is one of the four main reasons for spending time at a villa, the others being health/well-being, recreation/exercise, and rest/relaxation. The counterpart of the convivial spaces such as atrium and courtyard, are the quiet spaces for the *vita solitaria*. This house can be an enclave during the off-season or a public gathering space for extended

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2 Luis Barragán Pritzker Prize acceptance speech, June 3, 1980.

Happy the man, whose wish and care
A few paternal acres bound,
Content to breathe his native air,
In his own ground.

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*Figure 58. Pliny at his desk, writing about his villas*

*Figure 59. Stibadium at center of a Tuscan villa. Karl Friedrich Schinkel*
family members on holidays. The nearly-enclosed field in the southern corner of the site is an ideal hortus conclusus because of its distance from the dwelling, the surrounding windbreak of mature poplars, and the controlled state within that border. The barrier could be thickened with increasingly shorter rows of vegetation, and completely closed-off by walls or buildings.

Monasticism has existed since the Roman Empire crumbled, and villas became their own nucleii of civilization. Echternach Abbey was given over to monks in the 6th century after it was sacked by nomadic Frankish tribes. Fleury Abbey was once Floracium, a Gallo-Roman villa in the Loire Valley. During the Middle Ages, the monasteries provided protection from Gothic invasion as well as plague. In the monastery one could peacefully commune with nature in the cloisters and various gardens. The Villa Prelat offers an exchange of stress and superficiality, for an experience of calmness, reflection, sensory invigoration, and reconnection with wilderness.

Harbor Springs, Michigan is a wooded hillside that frames Richard Meier’s Douglas Residence. This project is a gleaming white mass floating above the trees. One must cross a narrow bridge, as if crossing over a moat, to enter the top floor just below the roof. The tight entrance opens onto a tall living space wrapped in glass. The entrance facade has a few small apertures, which contrasts with the large glass panes that allow uninterrupted views of the horizon across Lake Michigan. At this conspicuous hideaway, the clients are able to avoid intrusion while being completely open to nature.

Reemergence of the Villa Type

The Renaissance villa bridged the gap from medieval fortress to neoclassical country home. As in law, mathematics, music and other liberal arts, there was great interest in reviving ancient architecture. Pliny, Hadrian, and others who
wrote about the villa were rediscovered in the Renaissance. Leon Battista Alberti described the ideal villa suburbana with house, garden, and subsistence agricultural component in *De Re Aedificatoria*. In the Western World, as wealth became less determined by landholdings, the culture and society moved away from agriculture. Cosimo di Medici would “cultivate not his fields, but his soul” at the Platonic Academy at Careggi. During the Renaissance, the fortified towers were removed from Careggi, and a double loggia was added to the house to stagger the transition from exterior to interior.

Abundance of dwelling space and decoration, or of agricultural space and produce, is a hallmark of the villa typology. The *pinacothecae* (picture-galleries) of a villa could be covered in frescoes and ornate plasterwork, while the luxuries of nature could be found at the *oporothecae*, or fruit tree allées. Villas have long functioned as repositories for excess goods, including artwork. The villa typology was the locus of what became great public art collections in the Modern era because the plans are flexible enough to adapt to changing functions. The rigid structural frame and gossamer partitions of the Villa Prelat allow variant future uses to fit seamlessly within the texture of the site. The *villa rustica* is also well-suited to the production of art objects, and appropriate accommodations an artist-in-residence.

The *pars urbana* consisted of the residence and the garden. The medicinal, culinary, and pleasure garden layouts could be as complex as the dwelling interior. Partitions were often created by hedgerows and low fences, but the *hortus conclusus* was a walled garden, which provided more privacy than a typical fence would. Different experiences could avail the visitor per each outdoor room. The multi-sensory experience of nature could simultaneously include floral smells, baffled birdcalls, soft grass underfoot, the warmth of the sun and cool refuge of an arbor.

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3 Sullivan, p. 70

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Figure 61. Villa Giustinian with Medieval defenses surrounding Renaissance dwelling
Pivotal Historic Precedents

Figure 62. Rome's population reaches one million in 1st century CE.

Figure 63. Final Barbarian sack of Rome in 546 CE. Many villas were converted to monasteries.

Figure 64. The villa typology is incorporated into Islamic culture.

Figure 65. Pliny and other writers rediscovered in Renaissance. Middle class expands.

Figure 66. Andrea Palladio's villas flourish with the rise of the Republic of Venice.

Figure 67. Inigo Jones imports Scamozzi's and Serlio's drawings into England.

Figure 68. Colonists look back to Classical traditions to build the Americas.

Figure 69. Boscoreale and Villa of the Mysteries are discovered under Vesuvius.

Figure 70. Middle class expands in 1900s, and weekend homes are built.

Figure 71. Modernist values applied to all building types, including the villa.

Figure 72. Bourgeoisie search for new ways of experiencing the world.
The creation of the Venetian Republic in the 1500s eliminated petty warfare between Verona, Padua, and Vicenza. Unfortified country residences proliferated the Veneto as a result. The villas on this flat, humid plain were year-round residences and working farms. Andrea Palladio can be considered an early proponent of sustainable design because he embraced the ecology of the humid, swampy Veneto, and elevated the aesthetic of villas with visual hierarchy and symmetry. The necessity of the *barchesse* (attached barns) was not disguised but celebrated. The barchesse were designed to appear as equally necessary as domestic spaces. The Palladian villa typology consists of a prominent central pavilion with axial barchesse and loggias in an A-B-A rhythm.

In the mid 1500s, Henry VIII began to dissolve England’s monasteries. Highly valuable real estate that belonged to the Holy Roman See now belonged to England, and the Catholic prelates who once ruled the landscape were forced to flee. This aristocratic vacuum was filled by members of Henry’s court. As the new lords improved their country estates, the architectural vanguard of London inspired their development. Inigo Jones imported *I Quattro Libri dell’Architettura* to Britain in the early 1600s, and the Neo-Palladian villa subtypology subsequently dotted the valley of the River Thames and English countryside. This type of architecture came to represent political potency and sophistication. The Enclosure Acts of England in the mid 1700s forced many subsistence agriculture operations off of the estates of landed society, further widening the holdings of the aristocracy. Neo-palladianism proliferated in Georgian England with notable examples such as Chiswick House, Woburn Abbey, Chatsworth, and Stourhead. As the British Empire grew, the Palladian villa type spread across oceans and generations. In the American colonies, Neo-Palladianism symbolized the democratic values of Rome, as well as power and refinement.

1 Thompson, p. 217
Just as England ceded Catholic property to the aristocracy in the 1500s, the Spanish crown expropriated Jesuit landholdings, and expelled them from Argentina in 1767. Similar to the effects of the Acts of Enclosure, as barbed wire fences began to cover the Pampa, a feudal system arose, thereby suppressing the gaucho class. European immigrants hailing from Russia, Wales, and many places in between, benefitted from this arrangement. A comfortable system of absentee ownership and easy income was established where the ruling class could leave the city named for “good air” to find sweeter air at their weekend retreats. The rhythm of life at the modernized estancia was typical of a Palladian villa. An influx of Italian architects, stonemasons, and engineers entered Argentina in the mid-1800s. Their talents were put to use on the estancias to transmit the Palladian aesthetic to the Argentinian wilderness.
Tenets of the Modern Project distanced past architectural styles from the industrial 1900s only conceptually. The result of modernist intentions was abstracted classicism. Modernist doctrine denies historical precedent, but Le Corbusier abstracted the Classical orders in the Villa Savoye to communicate the purpose of the building: a weekend retreat reminiscent of the pleasure palaces of nobility. Because the Villa Savoye was designed with Classical proportions and 360° views, Colin Rowe compared the Villa Savoye to the Villa Rotonda in his essay, *The Mathematics of the Ideal Villa*. The thin, stilt-like piloti were essentially classical columns without ornamental expression. The ribbon windows along the piano nobile created a modernist entablature frieze. Whereas the geographical context of the classical villa was often used to create vistas, the Villa Savoye was sited in an isolated clearing of a woodlot, surrounded by a static backdrop of foliage.
The twentieth century ushered in the concept of the weekend, as well as the ability to travel quickly and independently, both having a significant impact on the villa typology. Ludwig Mies van der Rohe’s response to bourgeois prosperity and proliferation was visual and programmatic simplification and lightness that alleviated the weight of city life. The Farnsworth House was designed as a weekend retreat outside Chicago. Before the increased mobility of the twentieth century, one would have to store provisions to sustain the occupant for long periods of time. Along with the convenience of automobile travel came the feasibility of light packing. Motley assortments of personal effects in pigeonholes were unnecessary at the Farnsworth House. Instead Gesamtkunstwerk furniture and garniture sparingly filled the house. It is essentially one room organized into zones for sleeping, cooking, dressing, eat-
ing, and relaxing. Two service blocks are sandwiched between the deck and roof. One core holds the bath and kitchen while the other holds the wardrobe and cabinet. The cantilevered roof extends beyond the floor-to-ceiling glass curtain wall and column supports to appear floating and unobstructed. The deck is elevated 5’3” above a 100 year flood plain. The house is physically disconnected from the landscape, however, the walls seem to be composed of the surrounding tree boughs, thereby visually connecting it to the landscape.

The 21st century has seen an increase in the popularity of pre-industrial sustainable practices. Instead of retreating to a villa only on weekends, a seasonal stay could reduce the carbon footprint from frequent long-distance travel. To accommodate lengthy stays, the occupants must prepare for a long-haul ecological immersion, especially in remote countryside. The Hof Residence is located on the Skagafjörður of Iceland. Lilja Pálmadóttir and Baltasar Kormákur Baltasarsson commissioned Studio Granda to design a sustainable country home that uses renewable energy sources such as passive solar heating and photovoltaic electricity. Equator-facing clerestories capture the available daylight during dark winter months, and a geothermal system heats the floors and radiators. The subarctic meadow displaced by the building footprint is replaced on the roof of the villa. Exterior finishes such as cedar and concrete patinate beautifully in this harsh climate, while insulating the villa from harsh winds. The larder is an important room in the villa. It is clad in glazed white tiles with black basalt shelves that contain the perishable foodstock during winter. To contain the food, water, fuel, and other necessities for a seasonal stay, there must be ample storage room at the villa.
The concept of luxury is relative from location to location. Perhaps the most lavish dwelling in the Fouta Djallon region of Guinea, the Villa Eila is constructed mainly of mud and sisal. Eila Kivekas is a Finnish anthropologist who commissioned the firm Heikkinen + Komonen to design a home on the outskirts of a town called Mali. The property is large enough to be used for a small-scale farming operation or high-maintenance scenographic gardens. The project expresses abundance without crossing the threshold of overabundance. Many households in this region are land-rich, but do not yield much in crops. The house has inward-facing rooms with porches between them. Sunlight filters through the bamboo in the morning, and shades the long gallery during the day. The client desired a residence independent from mechanical utilities, and one that was made entirely from local materials and construction methods. The Guinean villagers handcrafted terra cotta tiles for the floor, and wove bamboo into a breathable brise soleil envelope. The client and architects’ main construction goal was to minimize the use of burned brick and imported materials. Brick burning is illegal in many West African countries, including Guinea, because it often exacerbates deforestation from using trees as firewood. Another goal was to limit imported materials because they require transportation infrastructure that is not available to the village. Stabilized bricks were manually pressed by the villagers. This technique is indigenous to the region, and the sociological goal is to empower the villagers by fostering local traditions. Their thermodynamic properties utilize the coolness of night and warmth of day.
Figure 86: Fallingwater
Figure 86b.
The main goals for intervening with the natural and man-made site forces are to extract its essential characteristics and celebrate them, to integrate the landscape into the built form, and to use local materials and practices.

The site of the Villa Prelat is a hemisphere away from the clients’ primary residence in California. Obviously, quick weekend trips to a typical villa are therefore not programmatic considerations. This is a seasonal residence, and requires accommodation for protracted stays, as well as easy maintenance for the six months when the clients are away. The closest regional airport to the site is an hour away in Gualeguaychu. A drive from the Buenos Aires airport, or from the apartment in Buenos Aires, to the site takes roughly four hours. The flight from Los Angeles to Buenos Aires lasts 15 hours while crossing four time zones to the east.

Figure 87. The distance between San Diego and Basavilbaso is 6,000 miles as-the-crow-flies.

Figure 88. 4 hours and 3 minutes from Buenos Aires International Airport to Pocamora.
The landscape of Entre Ríos is a mosaic of crops, rangelands, and urban areas. The site is located east-of-center of Entre Ríos, with three considerably larger cities about an hour to the east. The largest city within an hour’s drive is Paysandú, which is in the Uruguayan Republic, located on the opposite bank of the Rio Uruguay. Paysandú’s population is about 130,000—more than twice the size of its Argentine neighbor, Concepción del Uruguay, which has a population of about 60,000. The majority of the Enterrriano population live along the eastern edge of the province, however, the largest city in the province is Paraná on the western border, with over a quarter million inhabitants. The Villa Prelat is located in a rural area of Entre Ríos just outside the city of Basavilbaso.

*Argentine Mesopotamia* is a metaphorical moniker for Entre Ríos Province because it is essentially a peninsula between two major rivers. The province has historically been prone to periodic floods but now there is a tendency for cyclical dry spells, causing hardship for independent farmers who use the most basic irrigation systems.

**Surface**

The soil on the site is composed primarily of *vertisols*. This clay-rich soil shrinks during periods of drought, forming wide cracks. During periods of rainfall the soil volume expands and fills in the cracks, covering any seeds that may have fallen in. The soil instability caused by the shrink/swell cycle is exacerbated when rainfall is sporadic. Vertisols are not named after the color green as *vert* might suggest. Instead, the name comes from *invert* because after the topsoil has expanded around the objects that have fallen between the desiccation cracks, the subsurface clay is pushed above ground.
When the soil gets wet and expands, *thrust-cones* eventually form *gilgai*, and finally *cambic* horizonation. The ridges that result from the horizonation create small basins that can fill with water. The slow infiltration rate of the clay results in the formation of puddles, which turn into the black-bottomed ephemeral lakes known as hog wallows, or *saltanejos* in Spanish. These are often used as watering holes for livestock. Gilgai micro-topographies are especially prevalent on flat vertisol landscapes. The southeastern side of the site has 3 gilgai formations, and a fourth one sits near the center of the site.

To be considered a vertisol, the soil content must be at least 30% clay.¹ Montmorillonite is the clay that constitutes the majority of the soil composition. It is frequently used in industrial applications such as the construction of levees, plugs for water wells, and protective liners for landfills. It can also be used to remove moisture from humid air.

¹ Huang, p. 30-83
The soil is rich in calcium and magnesium, making the soil highly alkaline. Poplar and palm trees thrive in such poor soil. The instability and impermeability of the subsoil makes it difficult for some plants to take root, and dense forest is uncommon in vertisol zones. Vertisols can be tilled under a very narrow range of moisture conditions. They are hard and dusty when dry and very sticky when wet. Land in Entre Ríos is therefore frequently used for grazing, even though livestock risk injury by stepping into the cracks. Despite the challenges of soil management, the region is able to produce high-yield crops, including soybeans that are sold to the Chinese at top price.
The site is located in a farmland savanna that was previously an *espinal* forest of slow-growth scrub trees. The new tree species that populate the countryside are eucalyptus and poplar—planted for timber and protection from seasonal winds. The property boasts several rows of stately poplars that act as windbreaks, as well as mature eucalyptus trees that dot the site. Eucalyptus woodlots will be used partly to sustain the villa while also filtering the air, water, and soil.

Pioneer species, trees that grow bigger in less time, will be planted on site. A thick double allée of fast-growth mulberry will line the main entrance axis, opening at various points for views. The yatay palm and caranday palm, found in abundance at nearby El Palmar National Park, thrive in clay and sandy soil,
Figures 98 & 99b. Silhouetted landscapes of the countryside near the site

Figure 98. Silhouetted landscape of El Palmar
and are impervious to inconsistent rainfall. The native yatay and caranday palms will be featured on site for their architectonic trunks.

The site is currently cow pasture, but was at one time billowing wheat fields. A golden carpet will once again cover the area of the site surrounding the villa residence. The horses and alpaca will have access to graze on the areas that are cleared of vegetation in order to provide vistas. This is a low-maintenance and ecologically beneficial approach compared to mowing. Flechilla grass is the attractive, ruddy-tipped *malezal* grass that prevails in this region, although it limits the floristic diversity of the pasture. Prior to using the fields for grazing, the land was planted with soy beans, which are lucrative but take a toll on the fertility of the soil. Pennisetum and other native grass species grow thick and low to the ground, while Pampa grass can be arranged for architectonic massing. The mosaic grasslands of the region are mainly tussock prairie, or *pajonales*, of several grass species. The variety of grasses will be used extensively in the lawns and green roof gardens.

**Patio de los Jacarandas**

The client intends to plant jacaranda trees on the site. These trees have feathery purple flowers that erupt in November. They provide cooling shade, as well as psychological calm from light reflecting off the purple blossoms. The jacaranda fragrance will be pulled through the house past huge sliding glass doors and into the atrium. While native to the region, this tree has been used throughout the world on aesthetic urban streets because of its regularity of form, making pruning unnecessary. The jacaranda can, however, mature to yield an asymmetric open crown. This deciduous tree is drought-tolerant, and flowers during the warm months. The foliage is light green, and the bark is gray. The mature trunk diameter is 1.5 feet.

![Figure 100. Plaza Seeber near the Buenos Aires Zoo](image)
The *hortus conclusus* of an ancient villa often became a renaissance *giardino segreto*. Lorenzo di Medici relocated the Platonic Academy to the secret garden at the Villa Fiesole to surround himself with great thinkers like Pico della Mirandola and Poliziano. Villa Medici at Fiesole was one of the first villas to function solely as a pleasure villa—having no agricultural program. Michelozzo di Bartolomeo’s designs for cascading terraces and broad loggias provided places for discourse and peripatetic processing. The modern garden can be a special place of contemplation and study.

The Court of Oranges is an orchard-courtyard attached to the Cathedral of Seville. The cathedral was originally built as a mosque, but was converted to a cathedral after the Inquisition. As a mosque, there was no wall that separated the courtyard from the interior. The entrance to the house of worship was from a gate in the courtyard wall. The Muslim faithful...
would perform ritual ablutions, then walk past architectonic palm trunks, finally kneeling in a forest of interior columns. The columns and the trees were arranged on the same grid to unite the interior and exterior.

The Jacaranda Court of the Villa Prelat is a mosaic of trees, waterways, and paths, aligned to the 18’ square bays of the home. It is completely enclosed by the dwelling and poplar windbreak. The experience of the courtyard is multisensory. The ocular experience is dominated by green and pink light reflecting off the foliage and flowers onto the intricate geometry of paving stones. The evaporative cooling runnels, and the shade from orange trees create a soothing zone beneath the jacaranda canopy during summer. A mature orchard can evapotranspire as much as 600 tons of water per acre per day. A trickling fountain provides aural sensation, and the sweet smell of jacaranda blossoms swaddle the olfactory sense.

Figure 104. The central channel of the Villa Lante. Designed by hydraulic engineer and architect Tommaso Ghinucci.

Figure 105. Zig-zag furrows used for irrigating trees on fairly flat slopes (under 0.5%).
Diversity

Architecture cannot be considered green just by using environmentally friendly materials or by using energy efficiently. The Green Movement aims to merge the ecologies of people with the wilderness. Reconciliation ecology, as advanced by Michael L. Rosenzweig, is “the science of inventing, stabilizing, and maintaining new habitats to conserve species diversity in places where people live, work, or play.” To balance the ecology of the site it is important to introduce and restore plant species. Highly nutritious, dense, and diverse plots of native legumes, foraging grasses, shrubs, and trees contribute to a heterogeneous site ecology. Food plots for birds and other wildlife are located in the corners of the site. This will attract flocks of migratory birds. The bird excrement contains seeds from nearby vegetation that take root and grow thereby attracting flocks the next year, which furthers the process the year after that, and so forth. Staging zones on the site for migratory birds can be accomplished by limiting grazing from those zones. A mixture of architectonic planting and managed regional vegetation constitute the landscape of the villa.

Basso

A villa is inherently connected to its urban counterpart. Pliny’s Laurentine Villa was connected to Rome, Villa Capra is connected to Vicenza, and Villa Tugendhat is connected to Brno. To understand the nature of this villa, it is necessary to understand the city of Basavilbaso. This city has its origins in rail transit, and it was totally dependent on trains at one point. Throughout Juan Domingo Perón’s two administrations the state owned railroad was a major employer in Basavilbaso. In

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Rosenzweig.
the 1990s President Carlos Menem privatized the trains, and only the most lucrative routes were kept running. The subsequent decline in rail transit in Entre Ríos had a severe impact on the economy of Basavilbaso, as well as many other rail-dependent towns. The city has been left divided into four parts by the palimpsest of the railroad tracks. The city’s current leading employer is *Frigorifico Fava* dogfood brand, a Brazilian-based horse meat processing company that also processes chickens for human consumption. A noticeably unpleasant odor is encountered when driving by the factory.

Villa Prelat is located nearest the village of Rocamora, which is more picturesque than Basavilbaso. With roughly 500 people, Rocamora has a quaint tree-lined central plaza and cobblestone roads. Rocamora and Basavilbaso are separated by a winding creek called the Arroyo Calá. The distance between the site and the city is six miles. *Basso*, as the city is known...
to locals, has a population of about ten thousand, making it a rather small city. However, it is still the largest influence on the surrounding landscape, and is the nucleus of festivals and civic events, as well as the main hub of commerce in the area. A ten minute drive to the city connects the clients to markets and civic activity.

Lucienville

The agricultural land between Basavilbaso and Roscamora has more than a century of cooperation amidst diversity. This agricultural settlement is called Lucienville, and is known as the birthplace of the South American cooperative. Baron Maurice de Hirsch, a Parisian businessman and philanthropist, organized the eastern European Jewish colonies of Entre Ríos. (Because of massive emigration to Israel during the 1960s there
is now a much reduced Jewish presence.) Hirsch also invested in the railway infrastructure of the region, which attracted the other predominate ethnic subgroups such as the Swiss, Provençal, and Northern Italians. The client is Swiss-Methodist and still has relatives living in Bern, Switzerland. The regional landscape is a lattice of rich cultural heritage, with agricultural cooperatives, railroad infrastructure, diverse places of worship, and ethnic settlements that have had a major impact on the morphology of the landscape.

**Mosaic**

In 1573, King Phillip of Spain issued the royal ordinances as an urban planning manual for New Spain. The Laws of the Indies determined the 45° divergence from true north of the street and property grid. These guidelines established
that buildings be oriented so that light could enter every side. As cities expanded, real estate was more easily charted in a Jeffersonian orientation that corresponds to the cardinal points. The two grids meet at the nearby Arroyo Calá.

The 80-acre parcel of land that makes up the site is just one square in a greater mosaic of cooperation and diversity. The land allotment is not a perfect square; its cadastral dimensions are roughly 2500 x 2250 feet. This parcel of land could otherwise sustain a small-scale ranching operation or an 18-hole golf course.

The land surrounding the site is a product of culture. It is organized in a non-hierarchical grid that represents freedom, accessibility, and egalitarian values. The 18’ column grid of Villa Prelat is an organization tool for the building and site layout as well. Kenneth Frampton refers to space as a “more or less endless continuum of evenly subdivided spatial components or integers.”

The vernacular architecture of the region is simple yet cluttered. The buildings around the site are mostly structures used for storing or processing farming implements and produce. Small farmhouses cling to the road. Inhabiting the interior portions of the land allotment would be anomalous for this region. The Villa Prelat, however, is set back toward the center of the parcel.

There are existing zones implied by the windbreaks and hedges already on the site, as well
Divinity: Light/Fire: Vision: Hearth

Orientate
Ascend
Pray
Study
Write
Archive
Meditate
Exercise
Ride
Sunbathe
Entertain
Cook
Kindle Fire

Sky: Air/Wind: Sound: Membrane

Perambulate
Colloquy
Teach
Learn
Concentration
Diversion
Smell the Roses
Lounge
Cool-off

Man: Water/Vapor: Smell/Taste: Frame

Sleep
Make Love
Disrobe
Swim
Bathe
Hygiene
Launder
Rinse
Manual Preparation
Steep
Drink
Gather
Dine

Earth: Earth: Touch: Mass

Parking
Descend
Dispose
Compost
Cultivate
Harvest
Explore
Fruit Picking
Fishing

Figure 122. Heideggerian Four-fold: Aristotelian Element: Sensory Faculty: Semperian Tectonics
as implied alignment with roads and farm buildings on neighboring parcels of land. With the exception of some taller trees and occasional windmills, there are few vertical elements on this flat plain. The mirador is the primary vertical element of this project.

The site has great potential for creating special gardens, habitat for horses, and aeries to view the horizon. The region’s lack of sophistication in green design will make this ecological laboratory a nucleus for further sustainable development.

Weather

Entre Ríos lies in a humid subtropical climate region. The Po Valley, where the majority of Palladio’s villas are situated, is also in a humid subtropical region. Located on the 32nd parallel south, Entre Ríos lies in the middle latitudes, specifically the high pressure area called the *horse latitudes*. In North America the 32nd parallel runs from Arizona to Georgia. Optimal thermal comfort, between 70 and 75 degrees Fahrenheit, is rare in Entre Ríos. Common strategies of passive environmental design in this zone include high ceilings, large porches, single loaded corridors for cross ventilation, pitched ceilings for thermal updraft, minimal lightweight-construction interior partitions to promote air passage, and adjacent gardens and shade trees that condition the environment.

The summer months in Entre Ríos are generally hot and uncomfortable. The early mornings of summer, however, are cool. At midday the villages shut down from 12:30 to 3:30 for *siesta*, then people resume daily activities until about 8pm. The scourge of freon air conditioning has managed to miss this corner of Argentina, and it would be best for the environment...
to remain that way. “The fixed window and the air conditioner are mutually indicative of domination by universal technique.”

In Baso the families endure the heat in lawn chairs on the porch drinking maté from afternoon to evening.

The fall is also humid but less windy. February is the most comfortable month of summer, followed by favorable autumnal weather in March. By April the temperature has begun to cool significantly as winter approaches. Argentina’s winter months (June to August) have consistently cold temperatures, with rainy and damp weather sometimes resulting in frost. Agreeable daytime temperatures return in August. At the beginning of spring in September, the nights remain cool but the days are relatively warm. The spring has humid but cool easterly winds below seventy degrees Fahrenheit. Toward the end of the season in December, the days are hot and the nights are comfortable.

The wind velocity is highest in January at a high of 19 mph. The lowest velocity is in May at 2 mph. The annual mean wind velocity is 9 miles per hour. When the humidity is 100% wind speed is quite low—under 3 miles an hour. In the summer, when the temperature is higher and the air is drier, the wind speeds faster across the plain. This is referred to as the pampero winds. The first phase of a pampero event is the Pampero Húmedo (humid wind.) The second phase is the Pampero Seco, or dry wind, sometimes followed by a third phase—the Pampero Sucio (dusty wind.) These line squalls reach from Patagonia to Uruguay, but they are less vigorous once they reach the Argentine Mesopotamia. The pampero wind is usually strongest between October and January.
In winter, an equator-facing greenhouse will trap solar heat inside while providing a buffer zone from the cold winter air. It also allows sustainable food production during the winter months. A lime wash will cover the windows in the summer. Walls and roofs are painted white to increase the solar reflectance index, thereby minimizing heat absorbency.

A high air change rate reduces the humidity and accumulation of contaminants in an interior space. A thermal flue causes air to rise up through it when the surface is heated by direct solar gain. The air inside expands and rises, pulling denser, cooler air upward. A subterranean pool, called a qanat in Iran, cools the passing air through convection. Pulling air past a cistern would have the same effect. A south-facing opening in the mirador provides leeward pressure when warm prevailing summer winds come from the north. Stack ventilation pulls the cold cellar air up through floor vents, throughout the house, then up the double-story atrium, and out of the mirador hatch. A whole-house fan in the mirador supplements the lack of air flow. When the cool prevailing winds blow from the south, the same opening will scoop that cool air down into the atrium. In the equine zone of the villa, the evapotranspiration from the horse pool will cool the interior of the barn.

In Mali, the tribes of the Dogon build unique huts, known as the toguna, for the council chiefs. The roof is made from soaked thatch that cools the dim interior of the hut. Green roofs keep solar heat from moving through the building envelope into living spaces. With strategically placed roof monitors, the evapotranspiration from a green roof can also create a downdraft of cool air into the interior spaces. Roof monitors positioned at a constant interval in the villa will allow light and cooled air to fall into each room. The dead load of the hydrated growing medium requires increased reinforcement in the roof slab.
Liquid desiccant dehumidification is a process that uses a high-saline solution to absorb the humidity from interior air. The reduction of moisture is most effective when salt water is in motion; by pulling the water vapor from the air, and in this case, carrying the water along a runnel at the edge of a room. The narrow runnel that flows along a peripheral reveal in the floor also carries away dust that is pushed to the edges of the room. The same runnel defines the threshold between interior spaces. A geothermal radiant cooling/heating system is embedded beneath the jacaranda court, and transfers ground temperature into the main floor slab.

Autumn and spring are the rainiest months, while summers are often drier. The average annual rainfall for Entre Ríos is 45". The rain water on the site will be collected in a cistern beneath the Jacaranda Court, and recirculated from the rooftop garden. Overflow will be held in a bracket-shaped detention basin surrounding the patio. The primary use for the water will be drinking. It will be filtered several times as it goes through the garden runnels, ending up in a clean water tank. The rainwater will also be used to moderate the interior house temperatures by using a low-heat geothermal surface system. Gray water will be used for rooftop garden irrigation.

From the house latrines, black water is sent to a solar septic tank. The final stage of waste remediation occurs as the excess sewage overflows from the tank into a drainage field on the opposite side of the windbreak. Non-edible vegetation, mostly trees, will clean the toxic soil. The sewage composting unit creates garden fertilizer; turning waste into a resource. Since many fertilizers are petroleum-based, this is an easy way to reduce the carbon footprint while improving the fertility of the gardens. High levels of organic compounds are found in animal waste including nitrogen ammonium, organic nitrogen, phosphorous, and potassium. Bio-gas from sewage could potentially be used as fuel on site.
The following contemporary villas employ various strategies that comport with sustainable practices, and take advantage of the unique vistas and aspects of landscape.

The axes of the Neuendorf Villa converge at a courtyard hidden behind massive walls. Essentially one pivoting axis, the passageway connects a tennis court and lap pool via the residence. The prominent central pavilion and the axial elements evoke the Palladian villa type. Claudio Silvestrin also references the Palladian villa typology with a functional, compact arrangement of rooms; having common areas on the ground floor, and bedrooms upstairs. The formal purity on the flat landscape is maintained by sinking the tennis court to prevent cluttering the terrain. Neuendorf Villa was designed using 9-, 12-, and 18-meter modules. The façade, which is 9-meters high, surrounds the 12x12 meter entrance courtyard. A 1-meter-wide vertical gap in
the wall connects the courtyard to the 110-meter path between the garden and the Mediterranean wilderness. The austerity of the Neuendorf Villa emulates the absence of visual noise in Palladio’s villas.

The Residencia Valleacerón in central Spain was designed by Saneho + Madridejos in 2001. The exposed concrete structure of the dwelling appears to be a complex collection of folded planes. The architects used the fold parti to generate interior spaces of the dwelling, and to impart expressive form to the chapel. The folding and unfolding of the villa is a critical regionalist reference to the vast plateaus and random spurs off the Cuencan hills. The unraveling form around the house balances the tense, multifaceted chapel at the top of the hill. The informal geometry of the house makes it a restful counterpart to the crystalline form of the chapel.

Figure 132. The visual expression of the fold on and around the dwelling is most obvious at the wall-to-roof joint, and in the pool deck area.

Figure 133. The dwelling interior is liberated from the box form, cascading across the steppe of La Mancha.

Figure 134. The chapel is a tightly folded art object—a dramatic foil to the serene dwelling.
The Sheep Farm House was designed by Denton/Corker/Marshall on 750 acres of sheep stud farm in a rural corner of Victoria, Australia. A tall, thick, 650-foot-long U-shaped concrete slab wall unifies all parts of the compound, from cottage to guest cottage to garage, shed, yard, barn, etc. The approach to the villa is framed by the wall, but the compound is not understood as a villa until the user steps inside. The wall is a psychological shield that protects everything behind it, but also as a windbreak that protects the sheep during periods of inclement weather. Once inside, the free-plan interior is enveloped by full-height glass that stands in stark contrast to the massive wall.
The programmed spaces of the Villa Prelat were influenced by the villa of Antiquity, the Renaissance villa, and the International Style villa. Although the modern movement was charged with removing historical references from design, there are common spatial and programmatic aspects among the varieties. The shining white, sterile villas of Le Corbusier show a great many similarities to the scale and proportions of the villas all’antica.

Although the villa typology has changed over time, there are basic attributes that remain from the ancient world. There were 3 types of villa found in the Roman Empire: the villa suburbana, which was located just outside the city walls, like the Campus Martius; the villa perfecta, which had 3 sub-types (the villa urbana, villa rustica, and villa fructuaria); and the third category was the villa maritima, or villa imperiale. This villa type was often a magnificent seaside palace for the extremely wealthy.

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1 Pyectart
The urban counterpart of the villa was the *domus*, a city dwelling within close proximity to the villa. A common feature to many Roman villas was a “porticus-with-pavilions” tacked on the facade as a badge of Romanization.\(^2\) This brought an aesthetic balance and reinforcement of Roman cultural identity to villas that varied greatly in size and shape.

While the colonnaded facades and pavilions were more typical of Gallic territories, the peristyle was seen more often around the Mediterranean. The public room next to the peristyle was often paneled in marble, and used for ceremonies and entertainment. The wealth of the dweller could be ascertained by the number of porticoes, baths, entertainment rooms, lodging accomodations, as well as the greater number of glass windows around the villa. The ideal villa opened to the southeast, and sat on higher ground.

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\(^2\) Smith, p. 117
Le Corbusier’s concept of the *promenade architecturale* was used as a narrative device in the experience of his villas. The occupant ideally moves through the building precisely as the architect has proscribed in time and space. The approach to the Villa Savoye, and through the villa, reflects the increased mobility of the early 1900s. The driver first passes the caretaker’s lodge to arrive at the entrance, where the visitor could be dropped off by the chauffeur. The car then proceeds around the curved walls of the villa, for which the dimensions match the turning radius of the limousine, to park in the three-car garage beneath the main living spaces. At the entrance hall, four columns guide the visitor to ascend the circulation ramp, past the piano nobile, to the rooftop terrace. At the Villa Savoye, the story begins with a vehicular arrival, then features an elaborate ascension that ends at a forested vista.
<table>
<thead>
<tr>
<th>Water Treatment System</th>
<th>Geothermal System</th>
<th>Leach Field</th>
<th>Beehives</th>
<th>Barn</th>
<th>Forecourt</th>
<th>Garage</th>
<th>Parking Turf</th>
</tr>
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<tbody>
<tr>
<td>Fishing Pond</td>
<td>Pasture</td>
<td>Wind Generator</td>
<td>Compost &amp; Trash</td>
<td>Storage Cells</td>
<td>Portico</td>
<td>Bathroom</td>
<td>Master Bathroom</td>
</tr>
<tr>
<td>Outdoor Shower</td>
<td>Water Retention System</td>
<td>Root Cellar</td>
<td>Solar Generator</td>
<td>Rooftop Terrace</td>
<td>Vestibule</td>
<td>Master Bedroom</td>
<td>Master Closet</td>
</tr>
<tr>
<td>Fruit Orchard</td>
<td>Wine Cellar</td>
<td>Greenhouse</td>
<td>Kitchen Garden</td>
<td>Kitchen</td>
<td>Courtyard</td>
<td>Bedroom 2</td>
<td>Linen Closet</td>
</tr>
<tr>
<td>Quincho</td>
<td>Patio</td>
<td>Pantry</td>
<td>Scullery</td>
<td>Dining Room</td>
<td>Bedroom 3</td>
<td>Laundry</td>
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<tr>
<td>Lap Pool</td>
<td>Larder</td>
<td>Bathroom</td>
<td>Atrium</td>
<td>Small Bedrooms</td>
<td>Bathroom</td>
<td></td>
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</tr>
<tr>
<td>Studio Pavilion</td>
<td>Physic Garden</td>
<td>Ornamental Garden</td>
<td>Vine-covered Walk</td>
<td>Forest Preserve</td>
<td>Teahouse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 147: Cellular Composition
The clients of the Villa Prelat are the Familia Prelat, headed by Alfredo and Katherine. They have lived in many places around the globe but would like to spend more time in Alfredo’s homeland. They have two adult daughters, one living in Nashville, and the other living in Buenos Aires as she finishes her thesis on Argentinean politics. Adjacent to their property is the weekend home of Alfredo’s brother, Diego. Alfredo’s brothers, and their families, live near the site. The clients will possibly be hosting environmentalists and advocates for green technology, as well as painters, poets, and other artists. They will employ seasonal staff to take care of the villa when they are in California. It is likely that there will be some interaction between the clients and their new neighbors, and possibly local townspeople with interests similar to the clients’.
Alfredo opens his eyes, staring up at clouds against an azure backdrop through the skylight above his bed. He gets up and walks down the hall to check the news of the day from his laptop sitting on his desk. After checking e-mail for any messages from his daughters, he walks over to a crate of oranges where he picks out two. He squeezes them, pressing against a cold stone counter top. He then returns to the bed to wake up Katherine with the fresh juice. They lounge on the big bed for a while, staring out a full-height window at the grassy plain. They have 10 minutes before they have to leave to pick up their daughter at the airport, so they sprint back and forth between the shower and clothes rack and sink, then straight down a hallway to the car. The Concepcion airport is 45 minutes away. Their other daughter is carpooling from Buenos Aires with a friend, and will meet them at the airport. The flight arrives. They eat lunch in town.

Upon their return, the girls are tired from traveling and hot, so they put their bags down on their beds to change into bathing suits. They swim and lounge around for a bit. Katherine runs over to a low cupboard to find her suit. She quickly changes, runs back down the hallway, slides open the door and jumps in with the kids. All three bathers are about the same height, and the water level comes up to their mouths. The water is quite saline. They bounce on the balls of their feet and whirl their arms. A row of palms provides shade to hide under the intense sun. After a while, Katherine realizes that dinner will take a good amount of time to prepare, so she pulls herself up on a warm sandstone ledge and walks back inside where a cross breeze pulls the heat away from her skin. She towels off and grabs a sarong from a drawer. The cool terra cotta tile pulls the heat from her body as she walks past the energy efficient refrigerator, through a tight threshold and down a set of stairs into a cave-like environment to find a nice vintage of wine.
Sonia, the eldest daughter, sees her mother through the large windows fixing a salad, and her father nearby setting up the barbecue. She hops out of the pool, goes inside to change, and glides back outside on the warm stone pavers. There’s cutlery and linens in an outside cupboard, where she gathers supplies to set the table. Under a sweet-smelling wisteria arbor she lights several candles. The setting sun refracts light off the surface of the water onto the walls surrounding the table. By restoring much of the grazing land back to its original habitat, the clients have attracted many songbirds to the thriving ecosystem. Surrounding them is the din of warbling, trilling, and chirping. The barbecued Argentinian beef is ready. The salad bowl, bread basket, and wine bottle are on the table. All four take a seat at the cozy table and enjoy the spread.

After dinner the family basks in the light of the fire from the barbecue pit. As the coals die down they finish the bottle of Argentinian wine and look up at the stars unobscured by smog and light pollution. Andrea, the younger daughter, rises to her feet and decides to turn in for the night. At the threshold of the house a soft golden color fills her vision. Her sense of smell is heightened, and the scent of the Brazilian cherry paneling registers at every inhalation. The tall, heavy door to her bedroom closes and she hears the satisfyingly secure sound of the door latching behind her. She walks over to the sink basin for her nightly routine of making sure her face is well moisturized. She turns around and looks at the sunken tub before her. She descends a few steps and finally the inner glow from the wine matches the warmth on her skin from the bath water. She looks back out the window at the stars.
Hector, Alfredo’s nephew, gallops through the Espinal preserve on his way to examine the ankle of one of the clients’ horses. He rides high above the tangled canopy of espinillos. He meets up with Sonia who is soothing the horse. He dismounts once he arrives at the paddock and walks calmly toward the injured animal. The height and texture of the grass has changed. It is now much shorter and brushy. The smell of animals grows stronger. He crafts a cast for the ankle and feeds it a mild tranquilizer. It will heal soon. Andrea shows up with three yerba mate gourds for them to sip on. The three take a walk under a long vegetated tunnel, then return to the horse that is already up and carefully walking. Hector mounts his horse and heads out, but not before taking his horse to its favorite watering hole. Hector knows it is close to a thick stand of palm trees which can be seen from far away.

Diego, Alfredo’s brother, lives on the adjacent parcel of land of the villa site. He has heard the girls are in town and can’t wait to see them, but he also has local gossip to discuss with his brother. The noise of the dusty country road sounds very different underfoot than the crushed quartz of the road to the villa. It sounds crunchier and also feels firmer. The drive is lined by poplar trees but the few gaps in the canopy let in sunlight that reflects off the white stone right into his eyes. He squints and sees the family eating breakfast in front of the east side of the house under a vine-covered trellis. He picks up the pace and brushes past rosemary bushes to meet the family and exchange greetings. He and Alfredo then decide to go fishing. They grab their poles from a spear-closet and walk for about five minutes until they reach a shallow pond full of rushes. A wide pier extends 20 feet into the pond, where they sit and chat.
Ludmila comes by once a week to wash and press laundry, and clean the sinks, toilets, and showers. She also checks on the house when the clients are away. She loves driving up to the house—to her it is an oasis in this dusty corner of Argentina. The variety of vegetation and the multiple flocks of birds that change with the season, gathering around the ponds, makes the Villa Prelat a special place for her. As she drives closer to the house, the gravel slowly becomes pavement, very precisely, as if the amoebic gravel gradually metamorphosed into geometric tiles. She parks under a row of trees that border a large paved forecourt. She walks across the smooth white surface toward the entrance where she is greeted by Katherine. Today she’s needed to help prepare dinner. Ludmila grabs a chopping knife and julienness the garden vegetables on a huge block, as Katherine swirls around her preparing other parts of the meal.

Florian, the grounds keeper, checks on the animals when the clients are away. He also maintains the gardens. Today he is hosing down the horses and brushing the dirt off them. He opens the gate that keeps out the animals from the garden to pinch off some green leafy vegetables to feed the horses. He cleans the saddles, then scoops chicken feed and spreads it outside. Florian still has to tend the fruits and vegetables at the garden adjacent to the house. The walk to this garden couldn’t be more than five minutes long but at this time of day the sun is very bright, and he is exhausted by the time he gets close to the house. He leans against a thick, cool masonry wall under an eave and lights a cigarette. He looks back on the long path just walked, and thinks how beautiful and symmetric the building at the end is, as well as the trees framing it. After he waters the garden, he puts on his ipod and pedals back to the main road. He instantly misses the smooth pavement of the drive as he makes the turn.
Paloma, the curious neighbor, sheepishly walks towards the front door of the house. Alfredo welcome her and offers her money to harvest the orange orchard at four cents an orange. Paloma likes to walk around the villa when the clients are away. She’s been in the orchard many times. She likes to set individual leaves in the runnels and watch them move from tree to tree. She also likes to eat the strawberries.

Franquito, a student of Katherine’s, sits in the back seat of his parents’ minivan. His face is glued to the window in anticipation of visiting the villa. Today, Katherine is teaching him the nominative tense of English grammar. He sits at a large, thick tabletop as he works on a lesson sheet. Cool blue light pours through the window behind him. He is distracted by the delicate, expensive, crystal light fixture dangling above him.
Agustina is a painter, an artist-in-residence escaping the congestion of Buenos Aires for six weeks. She visits the family every once in a while, but it’s usually the clients who visit her in her corner on the villa a few times a week. Her studio is on the second floor of the pavilion away from the house. She can see the edges of the espinal forest. Her belvedere is quiet and messy. The floorboards were white when she got there a few weeks ago, and she’ll need to paint them again before she leaves.

Ron, a colleague from Stanford, is visiting Buenos Aires for a conference on the thermal-infrared analysis of minerals. The clients have invited him to stop by since he’s in the neighborhood. Ron has a bad knee and walks very slowly, so he parks his rental car at the back of the house where the surface is smooth concrete. He immediately grabs a 35mm camera to take pictures of the landscape before the sun sets.
The ecology of the site must be considered through daily cycles, as well as seasonal cycles, of inhabitation. The majority of the villa program is derived from daily life, but there are also aspects that respond to a perennial rhythm. The villa can be opened so that it breathes in the warm season, and closed off and compartmentalize in the off-season. The primary climatic challenge is the heat and humidity of the long summers. The other climatic challenge is to deflect wind and collect sun during the cool and windy, although brief, winters.

Figure 162a. Jacek Tylicki’s 365 Days. 1979.
The following precedents have ideal interior dimensions, and will therefore be used as a reference point for the size and shape of similar spaces at the Villa Prelat. The scale of interior (and exterior) spaces of this dwelling can be easily expanded because the site is so large. Even though walking long distances within the dwelling could maintain the inhabitant’s fitness, it could also detract from the architectural experience. Additional aspects of their spatial character provide inspiration for the design of the Villa Prelat.

Corridor

The Neugebauer House is a 180-foot-long single-story, single-family residence organized into five zones. The first zone is 10 feet deep. It is the primary service corridor that links the main entrances to the bedrooms and the kitchen. The second zone is 12 feet. It is composed of bathrooms, closets, a kitchen,
and secondary circulation. The third zone comprises the patio-accessible bedrooms, an office, and public gathering space, at 20 feet in depth. A central foyer isolates guests from the family. A 15-foot-wide patio comprises the fourth zone. A lap pool and reflecting pool make up the fifth zone at 12 feet in depth.

**Atrium**

There are many well-preserved Pompeian examples of atria. The atrium of the *Casa dei Vetti* is 900 square feet with a 120 sqft *impluvium* and a 60 sqft *compluvium*. The *Villa dei Misteri* has a 975 sqft atrium with a 100 sqft impluvium and 60 sqft compluvium. The *Casa del Menandro* has a 750 sqft atrium with a 120 sqft impluvium and 40 sqft compluvium. *Casa del Fauna* has two atria separated by storage closets. The private atrium

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*Figure 166. Séjour of the Maison de Verre. Pierre Chareau*

*Figure 167. Atrium of the Villa dei Misteri looking toward courtyard*
is 320 sqft with a 200 sqft impluvium and 100 sqft compluvium. The public atrium is 325 sqft with a 125 sqft impluvium and 75 sqft compluvium. A Modernist example of an atrium can be found at the Maison de Verre, a 480 square foot séjour at 17 feet tall, with an L-shaped balcony 3 feet wide and 46 feet long.

Courtyard

Casa Gaspar, designed by Alberto Campo Baeza, just outside Cádiz, is a perfect example of a compact-cubic villa, as opposed to the open-extended variety with forecourts and views stretching to the horizon. This house is insular and fortified. 12’-high walls enclose the house from which a 15’-high central space peeks above. The kitchen is 45 square feet and connected to a 220 sqft courtyard. Two 600 sqft patios sandwich the tall
living room of the same floor area. Two 120 sqft bedrooms are each attached to a private courtyard double the size of the bedroom. The fourth corner of the house is occupied by a 220 sqft garage.

Matera

Yerba Maté is the traditional argentine drink shared among all social classes. It is consumed daily with the same frequency as the British drink tea, although there is no specified tiempo del maté. It is taken at business meetings, during study sessions, and at ladies’ bridge parties. The maté gourd is known as a maté or a guampa. The guampa can be made by curing the calabash gourd with a hot maté infusion, letting it soak for a day, then scraping the inside of the gourd, and repeating once more. Matés are also wooden, ceramic, or silver. The bombilla acts as both a straw and a sieve. The submerged end is flared,
with small holes to catch leaves. The *matera* is a room within a barn or other agricultural building where laborers gather to drink maté. The maté ritual often occurs around a fire at the end of the day to rest and catch up with friends. The *calumet*, or peace pipe, is the North American equivalent of a maté. At the Villa Prelat, the matera is at the front of the private wing of the house and can fit about twenty. It is the male counterpart to the female atrium. An outdoor *genkan*, like a bombilla filter, is a place for people to take off riding boots before entering the matera. Cabinetwork and shelving will store their sullied gear. Stained panels of industrial plywood cover the matera walls to create an interior that appears soaked and scraped. In the center of the matera is a chimney with a massive flared inglenook that appears sieve-like. Throughout the villa there are filters of sunlight, heat, views, wind, and rain. The bombilla filter is an appropriate metaphor for the hearth of the matera.
The local cuisine is centered around beef. Cooking meat occurs outdoors during the summer to avoid heating an already warm interior. The barbecue shelter is called a quincho. The most primitive quincho is a covered outdoor porch, but it can be as grand as a completely enclosed barbecue pavilion. At the center of the Villa Prelat quincho is a long covered table that seats about 20 people. It is open to the elements on two sides, but can be fully enclosed by glass panels for use in winter. A set of dishes, cutlery, and serving utensils is stored in the traditional quincho, and the more luxurious quincho will be equipped with a dishwasher. The quincho at right is located outside Santiago, Chile. It has 700 square feet of deck space, 500 square feet of interior space including kitchenette and bathroom at 11 feet tall, and 900 square feet of roof, which cou-
ers parts of the deck. The quincho is the traditional male counterpart to the traditional female realm of the kitchen. Quinchos are often located near a briny piscine that both psychologically and thermally balances the heat coming from the barbecue.

The quincho of the Villa Prelat merges with the swimming pool. The wading pool is a swimming pond that uses biological processes to clean itself. An adjacent saline lap pool can be maintained without the use of chlorine and other harmful chemicals.

Cryptoporticus

The cryptoporticus was an ancient subterranean corridor that moved cool air throughout the villa. Designed parallel to the prevailing winds, they would bring breezes indoors. Pools adjacent to ceiling vents in cryptoportici would further condition the cooled air. At the Villa Prelat, small openings slightly above ground level surrounding the Jacaranda Court bring in reflected daylight and cool air from the pool’s surface. Dancing
refracted light fills the submerged corridor. As both a microclimatic device and passageway, this 8-foot-wide tunnel connects both ends of the villa. The basement acts as a humidity buffer so that the first-floor slab does not absorb dampness from the ground. Service rooms occupy the majority of the cellar, including the garage. The subterranean parking area creates a light court on the equator-facing side of the basement, where the secondary entrance is accessed.

A modern cryptoporticus can be found at the Villa Ottolenghi, designed by Carlo Scarpa. This corridor is 90 feet long and 3 feet wide. It is a stepped alley that wraps behind the house and splits off up the hill at the back. There are five pockets along the alley, each of about 70 square feet. It is covered by a rooftop terrace in some parts, and open to the sky in other sections. In this case the cryptoporticus is the calleta. The calletas of Venice are narrow pedestrian corridors along canals. It is a tight space, but allows the house to breathe by allowing separation from the hillside. This enhances circulation while also providing natural light at the back.
Azotea

The first European settlements in Argentina were fortifications. The estancia building type originated as a fort during the Iberian colonization of the Southern Cone plains. Now that the countryside has been tamed, a sea-change can occur that maintains the fortification-form. The original estancia was a one-story cube with a flat roof whence the inhabitant could view the surrounding landscape. This rooftop terrace, called an azotea, served the prospect/refuge function on the frontier. Terraces were also used as sleeping porches during warm summer nights.

The azotea of the Villa Prelat offers 360-degree views, as well as cool breezes perfect for naps in a covered hammock. A rooftop dovecote helps fertilize the second floor gardens. The low parapet wall provides privacy for rooftop activities.
The Villa Savoye roof comprises a terrace and solarium. The second floor séjour opens onto the 800 sqft rooftop terrace where a ramp five feet wide takes the occupant to the 700 sqft solarium twelve feet above the terrace. The Villa Ottolenghi rooftop terrace is 2,000 square feet.

**Guest House**

The layout of a typical colonial Argentine farmhouse surrounded a central patio of about 3,000 square feet. The rooms surrounding the patio were about 18 feet wide. The dormitories were between 50 to 80 feet long, separated by gender, and the barn and storage were each about 700 square feet.
ceiling was quite tall at about 18 feet. A creole main hall was about 150 sqft, with an attached kitchen of 20 sqft, and attached dining porch of 72 sqft. At Monticello, along Mulberry Row, a typical dwelling unit in the tradesmen’s quarters was 378 square feet.

Equine Program

The *pars equina* of the Villa Prelat is a *casco* consisting of a barn, paddock, stomping ground, training area, and horse bath. The horse bath is part of a Germanic tradition, with the most famous *Pferdeschwemmen* in Salzburg and Hannover. The barn is located downwind of the villa dwelling, and facing east to avoid the heat of the setting sun. The barn has three stalls of three different dimensions: 12’x12’, 14’x14’, and 16’x16’, as well as stalls for alpaca and goats. Two tack rooms bookend the barn.

Casa Egerstrom is the home of horse breeders living in Mexico City, where the horses themselves are integral to the landscape. Designed by Luis Barragán, this villa includes a full stud operation. A 9,000 square foot rectangular field with rounded corners serves as the training area for the horses. Alongside the field is a 13,200 sqft patio paddock nested into an L-shaped hay barn/stable. The 3,000 sqft rectangular hay barn forms an L with the 8,500 sqft rectangular stable. A 14,000 sqft long, a rectangular stamping ground lies parallel to the stable. A 5,600 sqft horse pool on the south side of the paddock is 7 times the size of the swimming pool for the dwelling. A 7,000 sqft garden separates the horse training operation from the dwelling.
At the Villa Emo, the barns do not quite touch the house, but are instead set slightly in front of the house. Each one is 50 feet by 150 feet. The corps de logis measures 75 feet along the barchesse axis by 66.7 feet perpendicular to that axis. The depth of each room is 30 feet, with widths ranging from 10 feet to 60 feet. A 15’ wide loggia along the front of each barchessa stretches 50’ long. The Tuscan Order was used in the design of the barchesse because of their utilitarian function and because the intercolumniations afforded wide berth for carriages. In contrast, the corps de logis boasts an Ionic loggia to communicate its status as the nucleus of the villa.

Garden

Ricardo Legorreta designed a barraganian villa in Brazil with smooth stucco walls that change hue in bright light and shadow. The solidity of the platonic geometry is mirrored by the formal gardens that follow architectural lines framing courtyards and paths. The compound is surrounded by a forest and open green park. Brazilian landscape architect Fernando Chacel “gradually [blended] the architectural compound and its more developed landscape with the surrounding agricultural lands, especially between the house and architectural outdoor spaces.”¹ Legorreta created a mediation of scale through the “visual connection between architecture and the enclosing plantings.”² Such plantings could include climbing vines, boxwood parterre, and roses.

¹ Martignon
² Martignon
### Program Summary

#### Site: 80 Acres = 3,484,800 SF
- **Atrium:** 900 sf
- **Dining Room (12-seat table):** 800 sf
- **Quincho:** 1,200 sf
- **Summer Dining Room:** 800 sf

#### Entertaining: 3,700 SF
- **Kitchen:** 440 sf
- **Kitchen Garden:** 220 sf
- **Wine Cellar:** 220 sf

#### Food Storage / Preparation: 880 SF
- **Bathrooms (4):** 45 sf per
- **Outdoor Shower:** 20 sf

#### Hygiene: 200 SF
- **Genkan:** 20 sf
- **Laundry:** 90 sf
- **Linen Closet:** 20 sf

#### Clothing: 130 SF
- **Master Suite:** 480 sf
- **Guest Suites (2):** 240 sf per
- **Small Bedrooms (3):** 120 sf per
- **Bunk Room / Loft:** 360 sf

#### Bedrooms: 1,680 SF
- **Breezeway:** 270 sf
- **Fruit Orchard Patio:** 1,000 sf
- **Pergola:** 3,000 sf
- **Rooftop Terrace:** 1,500 sf

#### House Exterior: 5,770 SF
- **Barn:** 7,500 sf
- **Bee Colony:** 400 sf
- **Teahouse:** 200 sf

#### Pars Rustica: 8,100 SF
- **Geothermal System:** 600 sf
- **Water Retention System:** 600 sf
- **Solar Generator:** 600 sf
- **Wind Generator:** 600 sf

#### Utility / Storage: 2,400 SF

#### Built Subtotal: 22,860 SF
- **Mechanical Space Factor:** 15%
- **Grossing Factor:** 25%

#### Built Subtotal: 32,004 SF
- **Garage (3 spaces):** 450 sf
- **Parking Turf (12 spaces):** 1,800 sf

#### Driving / Parking: 2,250 SF

#### Total: 34,254 SF

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Figure 193: Site plan and programmatic details of Monticello
Figure 194. The dwelling occupies just a fraction of the site.

Site = ±120 acres
The 80-acre site is divided into quadrants for dwelling, horseback riding, forest, and agriculture. The central node of the site is in the western quadrant where the dwelling is situated. Two major site axes meet at this node, and a large adjacent forest occupies the area between the axes. A narrow irrigation channel separates the axes from the forest, as well as a parallel grove of palms. The entrance drive from farm-to-market road is a long corridor tightly flanked by poplars and palm trees. An oblong circular drive in a park-like landscape is laid before the dwelling. The site is further subdivided using George Hersey’s split tree model that he ascribed to Palladio. The existing site patterns are bilaterally mirrored for the creation of subspaces. A view corridor crosses the site starting at the eastern road intersection and ending at the mirador. Physical axes like pergolas and cryptoportici, as well as visual axes, will connect the teahouse, barn, fishing pond, and other areas.

The parti of the project is the protective bracket shape derived from the existing windbreak. One of two existing on-site windbreaks was chosen as the location for the villa residence because it could create space without confining space. The bracket parti developed from the prospect and refuge that windbreaks provide. Inside the protective bend of the windbreak, the peripheral vision is anchored by the legs of the bracket. It gives the clients privacy and more control of the views than would be possible on the periphery of the site. The half-cloister shape of the dwelling nestles into a matrix of bracketing enclosures. Concentric allées bracketing the Villa Prelat are used as horseback riding paths. The nestling brackets can be understood as a larger composition from the elevated viewpoint of the mirador.
The most important sustainable strategy for the project is the conversion of the regional mirador form into an updraft tower. The pivotal architectural experience of the villa occurs at the atrium. It serves as a reception hall to family, friends, neighbors, and other guests. The atrium is the main gathering space of the dwelling, showcasing the clients’ art collection. The more intimate and informal gathering space is the adjacent matera.

The structure of the villa is a monolithic frame. Interior spaces are bound by concrete slabs, lime-washed concrete block walls, and glass curtain walls. The mood of the Villa Prelat is serene and timeless. The experience is a mixture of solitude and conviviality.

The instability of the soil resulting from the shrink/swell process necessitates building foundations that can withstand varying degrees of subsidence over time. It is important to have a deep structure that is impervious to this cycle, and will not move with changes in moisture. The soil on the site has a presumptive bearing capacity of 2,000 psf. Piling will be used to anchor the foundation above the cold cellar rooms and cryptoportici. Other parts of the dwelling on grade will be built on slabs of concrete resting on gravel that is used to buffer the shrink/swell cycle of the vertisol.

The curtain walls of the Villa Prelat are embedded in unistrut channels of concrete. They are set behind the structural frame, with the exception of the in-plane curtain walls on the north facade. Hinged doors within the curtain walls open onto the jacaranda court. The mechanical services are distributed at the periphery of each wing, covered in soffits that match
the width of the open doors. When the doors are opened in warm weather, they create a thickened yet permeable threshold between the interior and the jacaranda court. The curtain walls have double-pane low-emission glazing. During the summer many large, operable windows will keep cool air moving throughout the dwelling. In the winter, a tight, well-insulated envelope will keep warm air from leaving the home.

Part of the design intent is to “reinforce one’s body-centered and integrated experience of the world,” by creating multi-sensory environments. The sense of smell, and its associations, are also part of architectural experience (e.g. aromatic herbs in the garden, baked bread in the kitchen, barbecue in the quincho, maté in the matera, old books in the family archive, and perfumes in the laundry).
Appendix
Atrium Data

Space Name: Atrium
Number of Occupants (max): 16
Area and Min/Max Dimensions: 450 SF
Ceiling Height: 16’-6”

Activity Description:
The atrium is the heart of the dwelling. It is the salon for friends and visitors. It is the main living space as well as the main circulation space. Lounge furniture provides relaxation in the atrium. The functions of the atrium consolidate the traditional domestic requirements of living room, central hallway, and foyer.

Adjacencies:
Dining Room Loggia
Office Guest Bedrooms

Figure 199. Sky Space. James Turrell.
Proximities:
Kitchen       Bathroom
Greenhouse    Laundry
Courtyard     Vestibule
Master Suite  Fruit Orchard

Features:
Fenestration: Natural light from a wide aperture in the ceiling will flood the atrium during the day, and like the séjour of the Maison de Verre, the refracted glass block of the skylight will be illuminated from the roof at night.
Floor Finish: monolithic terrazzo with on-site gravel and ochre pigmented portland cement.
Wall Finish: Ebonized Fire-rated Timber
Ceiling Finish: Fire-rated Timber Panels
Acoustical: Fire-resistant fabric-covered panels placed on each wall baffle echoes.
Lighting: A skylight will completely illuminate the atrium during the day, and will be lit at night. A glass block area directly beneath the skylight will illuminate the cellar below, and be lit from underneath at night.
Other: The walls will meet the ceiling at nine feet and cant toward the skylight.

System and Utility Requirements:
Data/Voice: Yes >> Data for client to have internet access.
Audio/Visual: Yes >> Audio system a part of panel network.
Ventilation/Exhaust: Remote-operable vents around skylight and HVAC controls. Mechanical ventilation produces one air change per hour.
Temperature: Natural ventilation from the ceiling vents surrounding the skylight will moderate the temperature based on the thermostat levels

Humidity: An L-shaped desiccant channel along the base of two walls will wick moisture from the air, further dampen any sound reverberation against the walls, and carry away any dust that falls into the corners.
Piped Services: The atrium will require a fountain and drain at the ends of the desiccant runnel, and associated plumbing.
Electrical: Outlets along the walls every ten feet as well as outlets set into the floor. Floor outlets coincide with terrazzo patterns, and appear as brass inlays when they are not in use and covered by threaded discs
Security: All doors connected to atrium must swing out due to the central location of the atrium. Passages connected to egress spaces should be no narrower than 4 feet wide and 8 feet tall.

Furnishings and Equipment: Built-in nine-foot-high poplar bookshelves to stretch the wall lengths. Niches in the walls to correspond to chairs and tables of lightweight laminate wood. Furniture moves against the wall for large gatherings in the atrium, and matches the material finish to appear as an extension of the wall paneling.

Sociocultural Character: The sociocultural identity of the villa as a whole is to be seen as a catalyst for ecological human dwelling. The atrium functions as the interior space of the villa which has a quasi-public function as an interior reception room for community gatherings, so it has the added function as a showcase for sustainable design more than any other interior room of the villa. It is also the main interior room for entertaining guests.
Soil Properties

Figure 200. Ground surface formation

Figure 201. Diagram of round gilgai at the left represent the hogwalls of the site.

Figure 202. Diagram of round gilgai, lattice gilgai, and linear or wavy gilgai.

GROUND TEMPERATURE

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
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</tr>
</tbody>
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(Surface is freshly mown grass.)
Figure 203.

Figure 204.

Figure 205. Soil section showing how the shrink/swell cycle disrupts the horizons, or parallel geologic strata.
From grade level the mirador of the Villa Prelat reaches 30' in height. 

Weather Details
Vernacular Construction
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