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Houston Aquarium and Water Garden

By

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This thesis proposes to use the water gardens of the mid-sixteenth century Italy as a paradigm for building a water garden in Houston, Texas. Specifically, the Villa Adriana in Tivoli, 131 A.D., the Villa Giulia in Rome, 1550, the Villa D'Este in Tivoli, 1555, and the Villa Lante, 1565, are investigated through a site visit, historical research and formal analysis. The site of the Houston water garden is in the dense fabric of downtown on the site of the vacated convention center between Texas and Capitol Avenues and between Louisiana St. and the western edge of downtown, Buffalo Bayou. This site provided the opportunity for creating a connection between Jones Plaza, the cultural center of downtown, and the edge of downtown, the bayou.

The research and analysis resulted in paradigms occurring at three scales, the city, the garden and the fountain. At the largest scale, land acquisition, site preparation, and context provide clues to the first readings of the gardens, their forms and materials. At the scale of the garden, the site section and the degree of enclosure are important variables in the considering the type of planting and statuary. The garden's organization is determined by water and its use to illustrate a thematic program. The permutations of water as read in the fountains provide referents to the larger scales as well as a discussion concerning nature and artifice. The fountains', form, color, stimulus and container determine thematic origins for the garden and water.

The designed water garden focuses on the fresh water acquifers and springs of Texas, the streams and lakes of Texas, and the salt waters associated with Galveston Bay, Galveston Island and and the Gulf of Mexico. Flowing from west to east to align with reality, the new waters of the Houston garden begin at the bayou in a acquifer inspired tower and travel down a built aqueduct to invade the city center. Flowing opposite this architectural re-creation of the sectional landscape of Texas is a garden route commencing at the city's center to invite people to inhabit the cool waters built into the earth. In these two routes, the overall garden concurs with the paradigm set for in the research of the italian gardens: A rustic water element emitting vertical waters at the source of nature connects to a horizontal flowing stream of utility and terminates in a recreational body of still water located in the most artificial landscape.
The thesis departs from the pattern of the Italian gardens, by taking forms the tower and grid forms out to the bayou's edge to establish artificial order in the chaos of the freeway, street and bayou superimpositions. This attempt to oppose the context is an attempt to reinforce the edge of the city and provide an enormous fountain at the western entrance of the site while acting as a gateway to downtown.

At the eastern end of the site, in the city center, a large reflecting pond shaped by the city grid slides under the street toward the garden and bayou, terminating the built water sequence while initiating the landscape sequence. As a dislocated landscape, it creates a void sunken into the ground before Jones hall thus replacing the existing, non-collective plaza which is raised into the air. This layered slippage of landscapes reveals the inherent chaos typical at the edge and places it in the center. By contradicting the polar conditions at the site's extremities the users become aware of the mediating garden.

A third route attempts to extract people from the tunnel system beneath the city, to the new landscape of the sloped aqueducts roof. This landscape terminates at the tower in the west and provides non-tower dwellers with the panorama of west Texas.
# Table of Contents

1 Preface

I Two polar ideals: the city and the wilderness

II The mimetic landscape: the garden in the city

III The fountain

IV Water Gardens

V Site and Program

VI Conclusion

VII Jury Comments
Preface

The purpose of this paper is to investigate the issues related to designing an aquarium in Downtown Houston and to provide a methodology to be employed during the design process. While the idea for the project preceded the thesis intent, the thesis now has become the theoretical foundation of ideas upon which an architecture can be based.

The thesis is structured around three scales of investigation: The city, the garden and the fountain. The discussion begins with the aqueous origins of the city within western culture, then the second section distinguishes between parks and gardens within the city. The third section identifies the types of water while the final section, constituting the analytic dimension to this thesis, combines the previous three sections. The villas under consideration include:

- The Villa Adriana at Tivoli-118-131 A.D.
- The Villa Giulia at Rome- 1550-1555
- The Villa D'Este at Tivoli-1555-1572
- The Villa Lante at Bagnaia-1565-1575

The thesis concludes with a program and site description for a new aquarium and a set of propositions to tie a contemporary urban project to ancient as well as recurrent architectural preoccupations.
Section one

Two Polar Ideals: Paradise

"Paradise, in all senses of the word is the most striking place I can discover where an immaterial vision and a material structure or systems of relationships are brought together and depend on one another." ¹

McClung uses the polar ideal of Eden and Jerusalem, both Paradises, as a basis for the discussion of "man, nature and craft." The issue of polarization is a cultural one, which in this thesis, is described in historical, political, and material terms. Of Paradises past and future he writes"

"As a general pattern it may be said that to the extent that paradise is of the past, it is arcadian and open; the epitome of that nature of which it is but a small part.... to the extent that paradise signifies that paradise to come, it is urban and conspicuously fortified." ²

On the interaction of the two poles:

"The contradiction between garden and city and the complicated kinds of syntheses between them are pointers to the ambiguous moral status of craft as well as efforts to resolve that ambiguity." ³

This thesis investigates the introduction of an individuals will as garden into the collective realm as city. It inquires about origins, posits definitions and models for each of these polar ideals and provides arguments for ways in which some Roman gardens relate to their context. The synthesis between the two ideals is described by McClung in this manner:

"In heaven we understand a union of polarities, in Eden (on earth) these unified polarities appear in the form of the synthesis of organic and inorganic nature, each transferring to the other its characteristic virtue of vitality or permanence...but both are affirmed as distinct, complementary components...." ⁴

As immaterial vision, the polar ideals of paradise allow for a homogeneity which is not possible in our material landscape, therefore the polar ideals must confront one another- city versus garden. the transition from vision to reality requires a reference which is tenable and relative to the American context.
Landscapes: The American Wilderness, the town and the suburb

John Stilgoe in Common Landscape of America 1580-1845, defines landscape as

"Shaped land...a fragile equilibrium between natural and human force."  

In this definition there is a distinction between nature and artifice,

"a forest or swamp or prairie no more constitutes a landscape than does a chain of mountains. Such land forms are only wilderness, the chaos from which landscapes are created."  

There is then an extreme condition of wilderness which is wild, or untamed and the other extreme condition - the city:

"...when men wholly dominate the land...landscape is no longer landscape; it is cityscape, a related but different form."  

Although fundamental and simple to understand, current practical use of the word implies a reading of a exploited wilderness, totally at the disposal of the city. Like McClung, Stilgoe points out that there is a relationship between these polar ideals in which one conditions the other:

"Without the artifact, the wilderness is formless, the hill indistinguishable and chaos does not exist because it is everywhere."  

In the history of the American colonies, it was the cultural view of the city or settlement which conditioned the view of the wilderness. In New England,

"Puritans disliked the pathless forest because they entered it from open, ordered towns."  

In a strong community, many acts were decided for the benefit of the colony. Clearly artifice dominates nature when the

"household (is viewed) as a microcosm of the town,...(it) reinforced domestic order and made recognizable the pains of the houselessness, just as the town emerging from the forest made the wilderness all the more apparent."  

In contrast, southern colonists preferred individual settlements.
"By town, southerners understood something very different from the New England concept; they thought of town as a collection of stores, shops, offices and houses occupied by wholesale and retail merchants, craftsmen and their families (while they tended to the grand plantations). In the southern imagination, agriculturalists belonged in town only on market day; the rest of the week or month they devoted to their more less self-reliant holdings..." 11

The inversion of values into a nature dominated society was a result of economic demand. In the latter example the city is defined by the wilderness, in the former, the wilderness was characterized by what the city was not. In either case the two extreme polar ideals shape one another. In a predictable way, the pureness of the poles has become worn down over time so that neither is distinguishable. The result is the suburb, which is beyond the scope of the discussion and the park, which J.B. Jackson has studied extensively.

"The first designed parks dating from the sixteenth century were formal and elaborate gardens with small wooded areas created and set aside for the delectation of the court, though on occasion open to a limited element of the public,... but it was the so called picturesque landscape park, the product of eighteenth and nineteenth century England that inspired the design of the public park....which in America had evolved into the modern definition of... gifts from the people to themselves." 17

The park defined here seems more like a national park than the urban American park which developed from the early commons or green, the original use of which was more utilitarian than leisurely. Yet the quotation is important because it distinguishes the park as an open unenclosed relief. It also establishes a scale which is perceived as much larger than a garden. The park may be read as wilderness provided the city in its figural mass is of an appropriate scale and density to allow the open, and unenclosed park to contain the reading of otherness.

For this reason, the park is problematic in the cities of America which are of insufficient density to allow open space to be read as unique. The garden rather, as McClung has indicated, is the proper model of paradise commensurate to the city. J.B. Jackson indicates, that the connotation of a private gift to the city of a garden is a juxtaposition worthy of emulation:

"The value of parks is potentially as ever, The formal, structured park or garden as work or art for passive enjoyment is essential as an urban amenity, particularly in the downtown working area." 18

The Garden
The Italian villas and the morphology of their gardens provide a recapitulation of the issues of polarity.

"Garden comes from an Indo-European root *gher*, which appears in many Latin, Greek, Slavic, and Germanic words..." which "clearly imply enclosure or an enclosed space, and in modern German, 'Garten' seems to indicate less what our dictionaries define as 'a plot of land used for the cultivation of flowers, vegetables, and fruit' than it does an enclosure or container." 19

McClung reinforces this notion of garden as a mandate of its survival.

"The walling of Eden is a condition of its survival... "The power of the walled garden as figure seems to depend more on its wall than the garden with them." 20

This implies the primary necessity of being read as a polar condition:

"The presence of a wall of some kind, artificial or natural, around the actual and metaphorical gardens... is the primary architectural event that marks a synthesis between Eden and its rival archetype. 21

The garden only in this form can become a mediator, able to convey its own essence to the city while retaining it.

"Where the garden must dominate... architecture is accommodated when it submits to perceived laws of nature or laws of the nature of materials." 22

The garden, and the dwelling are archetypes which share the common elements of enclosure, organization, permanence, privacy and water. Of the earliest uses of gardens, the primary function was protection for desert nomads who fenced in their oases. The first gardens were political acts:

"Each individual household, having settled in a certain spot, would build a fenced or hedged enclosure around their farmyard... an adjunct to their household. It was put to permanent use by this group and so identified itself with them as a permanent site." 23

"Once the hedge or fence was erected, the authorities recognize its autonomy." 24

They were also ecological:

(The garden) "was always based on a systematic intervention in the natural order, on the creation of an artificial environment" 25

Gardens were also practical:

"Most gardens were unkempt and related to utility,... a primitive disorderly farmyard... nowhere in this enclosure was there any evidence of taste or feeling
The gardens is artifice, a landscape not wilderness. This distinction is important because parks, in their picturesqueness are seen as nature while gardens are closer to building in scale and morphology. Although the first gardens flourished as private extensions to the dwelling early public manifestations of the archetype existed during the Roman Empire, serving as gifts to the people:

"So Julius Caesar bequeathed his garden on the right bank of the Tiber to the Roman people and Agrippa left the Romans the gardens in the Campus Martius near the Baths he created for the people." 27

Public access to private gardens also was possible during the fourth century:

"The gardens of Sallust between the Quirinal and Pincian hills, later owned by the emperors, may have been accessible at least by the fourth century to some of the public," where "...Seneca and his friend Lucilius 'retired to the gardens of Sallust'..." 28

During the middle ages however the private garden was relegated to the interior of religious monasteries as a cosmological place of contemplation the highly formalized walled precinct of nature was a symbolic representation of God, the creator of nature. Retaining elements of sacredness and privacy, writers like Petrarch and Boccacio extolled the virtues of the country life and the religious experience associated with the maintenance and enjoyment of a garden. With the rise of scientific discovery in the 14th century, the garden became a display of botanical types for public enjoyment. Combining the sanctity of the contemplative medieval garden and the enjoyment of the public botanical garden,

"the garden rose to a position of prominence and prestige...a source of stimulation and knowledge and shared delight...it became a sacred place...of discovery." 29

As answers to the questions of the world moved the humanists to the enjoyment of God's handiwork, public access to private gardens again became common.
"The changes in the purpose of the Roman villa and garden came about toward the end of the fifteenth century, as a result possibly of several factors. Certainly the collecting of Roman antiquities and their exhibition in Roman courts and gardens, commencing in the late fifteenth century, encouraged access to their gardens...similarly, the humanists and antiquarians must have been aware of the public nature of some ancient Roman gardens." 30

With the ideas of the Renaissance in place the rehabilitation of the landscape as an extension of the villa became the responsibility of the architects who demonstrated dexterity with:

"Strong terraces, strong walls, very clear-cut space."31

The gardens of the second-half of the sixteenth century occupied a special place in the history of garden making:

"the first breakaway is the Villa Giulia(1550-1555). It is an architectural complex set down in a planted landscape...they brought in thousands of trees to plant the hillside, ...the garden begins to open out into a larger context."32

As a quasi-urban (privately owned yet publicly enjoyed) means of establishing an order within the city, the gardens of the Renaissance occupy a small niche between the inwardly focused and religious medieval gardens of the 13th and 14th centuries and the 17th and 18th century gardens of the enlightenment which resemble ordered parks or picturesque wilderness. The Roman gardens considered best illustrate the approximate relationship to the site and program of this thesis because they consider movement through the site engaging the two polar ideals of city and wilderness. Additionally, they create a private world based on a systematic intervention of the collective realm within which they exist.
Section Two
The Mimetic Landscape
The Romans attitudes about landscape intervention may be more related to the classical notions of creation than to city/wilderness polarity.

This is related to Aristotle's idea of Mimesis, which he used in his Essay on Poetics as a criticism of Platonic notions of Greek actors. To briefly explain the argument: Plato's

"purpose in reviving this special sense of Mimesis is to point out the danger to his young guards... of Homer. Homer does not merely present his characters;... he pretends he is those characters and it was real fear in Plato that Aristotle's redefinition of imitation was to address:

"...from childhood it is instinctive in human beings to imitate, and man lessons by imitation...we have evidence of this in actual experience, for the forms of those things that are distressful to see in reality,...we contemplate with pleasure when we find them represented with perfect realism in images... imitation is something we have by nature..."34

These ideas are said to lay dormant during Imperial Rome yet,

"It was only with the fresh interest of Italian humanists in the sixteenth century that it assumed a central place in current literary theory and criticisms."35

Mimesis then as exemplified in the Italian gardens under consideration is creation, a representation of the real in an ideal setting for leisure and contemplation.

While the ancient Villa Adriana at Tivoli c.125 may be read as a true suburban villa, the other three Renaissance villas: The Villa Giulia at Rome c.1550, the Villa D'Este at Tivoli c.1555 and the Villa Lante at Bagnaia c.1565 are urban. The Villa Adriana is far enough removed from the town of Tivoli (6km) to read as a totally autonomous complex, but the other three may be read as extensions of their respective cities or towns. Ironically the Villa Adriana, the alternative to the city produces the most interesting criticism of the idea of city as understood today.

There is evidence that Hadrian himself was the architect of the vast complex and as an emperor who accompanied his forces into foreign lands on conquests, his villa exhibits influences of monumental places abroad and a layering of constructions which were probably the result of dormant periods of administration.36 The decision to build out in the countryside 30km from Rome
was no doubt a response to the negative reaction by the people of Rome to the emperor Nero's Domus Aurea or Golden House. If Hadrian built a small city out in the wilderness, Nero built the wilderness in the middle of Rome.

"the crimes of Nero extended to the field of Architecture. their objections to the golden house rested less on the opulence of the palace, by now expected of the emperor, than to its site and scale..."37

Seutonius, a Roman patriarch describes the palace as a "rus in urbe", which contain the Latin roots for rustic and urban.

"A contrived solitude of woods and vistas and open pastures..there was an artificial lake to represent the sea and on its shores buildings laid out as cities and there were stretches of countryside." 38

We see in this act of garden making a political gesture which was common to most Romans:

"Each attempted through setting to establish total visual control and by implication, physical possession over the landscape. Hadrian's... villa at Tivoli, spread itself in every direction with extensive colonnades, walls, thermae, and outbuildings." 39

Villa Adriana provides an excellent lesson on the making of cities according to Fred Koetter and Colin Rowe. In Collage City the two historians discuss the various aspects of the garden as a paradigm for the American City using Versailles, upon which Washington DC is planned, and Villa Adriana as respective homogeneous and fragmentary models.

"there is unambiguous, unabashed Versailles. This is total control and the glaring illumination of it. It is the triumph of generality, the prevalence of the overwhelming idea and the refusal of the exception. ....Hadrian who is, apparently so disorganized and casual, who proposes the reverse of any totality, who seems to need only an accumulation of disparate ideal fragments and whose criticism of imperial Rome (in configuration much like his own house) is rather an endorsement than any protest." 40

The large garden of Hadrians Villa may be read as a series of architectural gardens linked with water and visual axes which center shift and re-center almost endlessly. Each area is autonomous yet linked to the others much the way many cities' neighborhoods and districts set up and yield to the adjacent areas. Rowe remarks,
"It should be apparent that the manifold disjunctions of Hadrian's Villa, the sustained inference that it was built by several people at different times...might recommend it to the attention of political societies in which political power frequently changes hands...one can only believe in its promotion."  

The Villa Adriana provides an ancient precedent for the other three villas under consideration and emerges as a model for content and the idea of living in the country while retaining aspects of the city existence be it architecture, or views to the city.

Like Villa Adriana, the 16th century villa gardens were more a series of exterior rooms linked together by axes and adjacencies, yet in their formality and sense of order they read more as extensions of the city than alternatives to it. These gardens are part of villa complexes or vigna, which were retreats for religious popes and cardinals.

"The tradition of villegiatura or withdrawal to a country residence...a central feature of Italian life in the later middle ages and the Renaissance when urban centers arose to political prominence and there developed a leisured class of money."  

It was imperative that villas contain aspects of the polar opposition to the city existence: nature and the prestige of relative solitude. Maps of Latium illustrate the locations relative to Rome. Villa Giulia and Villa Lante are located in large naturalistic settings just outside their respective cities. While Villa D'Este is abruptly placed in a corner of Tivoli between the city wall and a town piazza.

The villa with the least confrontation of garden and city was oddly enough the Villa Giulia at Rome. It is located just north of Rome near Villa Borghese and is incorporated into a large vigna which created a transition to the campagna. Its vigna contained what in Italian is called a Natura Bosco, or what might may be thought of as an idealized forest.

"It was planted with thousands of trees over the entire vigna, bearing fruits, nuts, etc... in which game birds would be let out to feed so that they could later be hunted."  

The villa contained no major living facilities and was used by Pope Julius III to entertain visiting dignitaries and to relax away from the Vatican. The Villa entrance extends down a hill to the Tiber River via a newly constructed road bearing his
name. At the major intersection near the river, an elaborate gate was constructed and at the river, a boathouse. This infrastructure provided a link to the realms of the patron allowing him to retreat, relax, and return to reality all in the same day. Spatially, its concentric layers of Nymphaeum, Casino, and Vigna provided a microcosmic paradise totally independent from the city.

The Villa Lante at Bagnaia may be read as a transitional element just outside the city between the city and wilderness. Cardinal Gambara chose Bagnaia because of an existing hunting park located at the site of the present villa. Most of the site is designated to a large public park which is naturalistic and contains fountains within the forested areas. Even though the park and gardens nearly double the area of the town, there is a very visible adjacency at work in which the walled garden is the mediating element between the town and the surrounding wilderness - the park. In fact when in the garden, organized along a central path rising up a hill to the wilderness with the town down the hill it seems very tenable that,

"The intention of all this was to provide a vantage point. The landscape around on the larger scale was part of the design of the building...through the capturing of the view, indeed, the whole wider landscape was made subservient to the one villa and could be thought of as serving the purposes of its owner."  

One is inclined to say that Cardinal Gambara believed himself above the town or that he owned the town in a domineering fashion. Yet to briefly defend the Cardinal is to point out that the architect Vignola constructed the two casinos as garden elements of a relative lightness which parted to allow the water elements to make their way down the hill and metaphorically reach the town. It seems then that the Villa Lante is a much more paternal gesture, an amenity for the town. This is apparent when one considers that there are two publicly scaled portals which face the town. One provides access for the general public to the park and the other for the family into the garden.

The Villa D'Este is located within the city walls, a literally urban garden. Because of the positioning of the landscape elements, the residence has a view out over the countryside but not into the garden, thus creating an ambiguity from within as a suburban garden, and from without as an urban garden. This fact makes the Villa D'Este the most interesting garden to study for its juxtaposition of polar ideals of city and wilderness. This villa like the Villa Lante is an extension of the city.
D'Este chose Tivoli because it was a common site for the villas of ancient Roman nobility. Unlike the Villa Lante's acquisition of a well prepared hunting park, the designer of Villa D'Este, Pirro Ligorio challenges the Roman notions of intervention as creation. The cities' infrastructure is taxed in two main regards: water and land.

"From 1560 to 1561 an aqueduct financed by the commune and the cardinal brought water from Monte Sant’Angelo to the piazza in front of the church of Sta. Maria Maggiore whence some water was diverted into reservoirs under the old monastic cloister, which would soon be converted into the court of the cardinal's villa. Two years later excavations were begun for a long conduit cut under part of the city of Tivoli from the River Aniene near the famous cascades of Tivoli to enter at the east corner of the gardens." 48

"A tremendous amount of earth had to be removed... from 1560-1565 the principal work...was the engineering essential to preparing the site. 49

In addition to land preparation, much of that land had to be acquired in a manner similar to the way current highway construction displaces generations of families through principles of eminent domain. Dissimilar to current methods is the notion of city as part of that landscape which we are able to reconstruct:

"The Roman idea of countryside (our version of landscape, or the defined thesis condition of wilderness) did not have the same associations with landscape as our own. The natural landscape for the Romans included the works of man and above all the city." 50

The only evidence one needs to see the land shaping done at the Villa D'Este may be discovered when looking over the four foot high wall at the gardens edge at the lower plateau, and seeing a seventy foot drop to the ground outside the city wall. The ground of the lower plateau is comprised of about fifty foot of fill.

The Villa D'Este contains some other amazing juxtapositions. The transition, views and access from the city to wilderness is very different from Villa Lante's. The main entry portal is located on the wilderness side of the gardens, away from the city. The most private area of the garden is the monastery renovated into the residence which is backed up to the town. Ironically the area nearest the town, is planted the most rustically while the more formally planted areas within the garden are nearest the wilderness. When in the villa the trees prohibits a view of the formal garden which is planted in parterre fashion and one would really benefit from an elevated vantage point. The view from the main loggia balcony of the vast Italian
countryside causes the association of man’s domination over the landscape to have far greater implications than those at the Villa Lante.

The other irony about the inversion of the rustic and formal plantings is that the monastery is virtually out of sight from the lower parterre, creating a very private estate, less a paternal amenity than the private garden accessible to the public at Villa Lante.

Where the ancient Romans may have had a notion that the landscape and wilderness were synonymous, the Renaissance gardens exhibit a clear sense of polarization. One feels that they are either in or out of the garden and that the garden is either in or out of the city.
Section Three

Water Background

This thesis has discussed notions of landscapes, cities, and gardens as forms. Only with the introduction of mimesis may one consider how these designers accomplished the magnificence associated with the Sixteenth Century water gardens. The discussion of the water element in the garden is complex because of the many relationships established by its presence. As a fundamental element, water has acquired many uses and meanings which are represented in the gardens. To simplify the investigation of water's background, the discussion of water begins with the pragmatic and concludes with the metaphorical.

The Water of Utility

The primary importance of water is related to its endless utility. As a potential seed of life, the presence of water in the gardens was not only desirable but vital to its survival. The need to have water at our disposal as precious commodity exists at all scales. All civilizations require the management of water. Beginning chronologically, it is apparent that the first forms of western civilization were highly dependent on a location between two bodies of water. The rivers Tigris and Euphrates provided the life blood of the communities in Mesopotamia.

"The oldest settled communities are not found in the river valleys but in the grassy uplands bordering them....It was only after village farming life was developed that settlers attracted by the greater fertility of the soil, moved into the river valleys and deltas." Here civilization as we know it and systematized agriculture originated in the fourth millennium B.C. 51

The community was developed because of the location of water, which earlier than Babylonia at:

"The site of Jericho, a plateau in the Jordan River valley with an unfailing spring, was occupied by a small village as early as the ninth millennium B.C." 52

To man, water's presence is critical since it comprises seventy-eight percent of the composition of human bodies:

"In the fertile lower valley of the Tigris and Euphrates man may have found the equivalent of the garden of Eden celebrated in Genesis and long a part of the tradition of Mesopotamia. Once he had learned the arts of irrigation and to degree, the control of floods, the possibility of creating a great oasis was before him." 53

Vital as water was:
"Violent floods occurred periodically and were disastrous. Thus through dependence and fear, the primitive cultivators developed a reverence for water." 54

As communities formed and population grew, man power could initiate large land works to mitigate the unwanted natural forces and manage the supply,

"In order to bring fertility to large water-deficient areas,...man had to create large scale enterprises that usually were operate by the government. The emergence of big productive water works (for irrigation), was frequently accompanied by the emergence of big protective water works (for flood control)." 55

In ancient Rome the main problem of obtaining water in a relatively dry climate created one of the worlds first hydraulic engineering societies and produced one of the ancient wonders of the western world-the Roman aqueducts:

"But if anyone will note the abundance of water skillfully brought into the city, for public uses, baths, basins, runners, gardens, and villas; if he will note the high aqueducts for maintaining the proper elevation; the mountains which had to be pierced; the valleys necessary to fill up , he will consider that the whole terrestrial orb offers nothing more marvelous." 56

The first aqueducts were built around 312 B.C. (until-226 A.D.) along the Via Appia east of Rome and derived from a spring. The aqueducts, contrary to popular belief, were usually underground conduits and only raised on arched carriers around the city as the ground elevation dropped and the higher water elevation was necessary to maintain water pressure. 57 The aqueducts, originating at a distant spring in the wilderness and traveling horizontally into the city are perceived as waters of utility, a friendly man-made river free from the liabilities of an immediate abundant source such as those related to the Tigris or Euphrates.

All trace of hydraulic engineering vanished during the Barbarian invasions except for a few thermae, fountains, and aqueducts; the methods and controls of circulation of which were lost until 1429 in the discovery of an ancient book by Frontinus called De Acquis Urbis Romae 97 A.D.. From this account was discovered that 230 of 270 miles of aqueducts were underground and could only be discovered by locating the lime deposits buried along the cement lined ducts. The lime was a by-product of the running water which needed to be removed periodically as it impeded flow. This scientific information helped fuel the interest and capability of returning the gardens of Rome into water immersed displays of pleasure. Through
the medium of fountains, the Romans could revive the friendly association with water they had known during the reign of the empire.

The Fountain

The origin of the word fountain is from the Latin "fons et origo" meaning "source". This is related to the image of water as a physical source, usually a spring. These Greek and Roman springs were marked with architecture, and sculpture which was in keeping with the qualities of the water contained or supplied.

"It became necessary to enclose the springs in order to preserve their purity..." 58

This is similar to the idea of a fountain which is known for its supplying statue rather than for its water, architecturalizing the matter. However the water retained many of its own qualities:

"...the sacred springs soon became architectural fountains all over Greece. Some were celebrated as medicinal springs, others were oracular, and each spring had its own genius, so that the invalid, or the person who wished to penetrate the future might go on pilgrimage from fountain to fountain." 59

The form of the garden fountain derives in part from the image of a grotto portrayed in the ancient Greek poetry of Homer's Odyssey and the image of the nymphaeum present in the ancient Roman poetry of Virgil's Aeneid. The writings of Homer contain a reference to "the cave of the nymphs as a place of initiation", the nymphs are associated with a place, in this case a cave which was attractive due to the presence of a spring. The cave in Italian is called a "grotto", and now by association contains the element of the spring by implication.

Its no wonder the "grotto" is retained by Roman garden design with references to pleasure such as this to convey. Usually built into the side of a hill or a wall disguised to resemble earth, the grotto is a source in many italian gardens which progress from the ground upward to the summit of an incline so that the grottoes would not be missed. 60 This rusticity is significant when considering that the gardens are usually rendered as artificial, idealized worlds, placing the grotto in the distinction of being the most crude form of fountain. This crudeness may also be termed unrefined, or simple, therefore allowing a connotation of being associated
with the earlier Classical gardens that were very important to garden designers.

Opposite the simplicity of the grotto is the finely crafted fountain type called the Nymphaeum.

"Beneath a precipice, that fronts the wave with limpid springs inside, and lay a seat of marble, lies a sheltered cave, home of the Sea-Nymphs." Which in Latin is written "domus Nympharum"-hence the word Nymphaeum. 61

This quotation illustrates the more finished marble seat than a grotto connotes and in practice were free standing screens or walls which resemble stage backdrops because of the statuary niches and grand scale and width. In some instances the Nymphaeum was built very close to the house and appeared as part of the elevation because of the refined appearance.

The urban fountain is probably the ultimate "type" of the legacy of the Greek springs. The urban fountains of Rome were celebrated points in the city which marked the arrival of the aqueducts' precious resource. These points of distribution or castellum were publicly impressive fountains of which the Trevi fountain is one. The entire cycle of fountain water is described by Morton,

"An aqueduct had numerous castella and the chief was invariably an impressive fountain with an inscription, while behind the scenes a maze of pipes carried the water to the fountains, baths, public buildings and the ground floors of private houses. Still moving, the water flowed on to flush the sewers and eventually discharged itself into the Tiber." 62

The urban fountain then is a public gesture, a celebration in a space, usually a piazza providing a focus. ie. Bernini's Fountain of the Four Rivers at the Piazzas Navona. In occupying the space it becomes the literal icon associated with the piazza or even the area, as many contemporary tourists' maps will indicate. The urban fountain unlike the garden fountain is usually disconnected from its context and reads as figure in a void dominated by architecture.

**Water in the Gardens**

Perhaps the main source of reviving the ancient's use of water in Renaissance gardens was the letters of Pliny the Younger which rival Thoreau in their demonstration of man's oneness with nature in his description of a room:
"Opposite the central part is my den, a bay window which can be shut off from the rest of the room by drawing the curtains or mad a part of it by leaving them open. It contains two chairs and a couch, the sea is below, the woods above, the rest of the house is behind." 63

Here a window is a room in a nature comprised of a foundation of water and a sky of trees. Running water was a critical element, a luxury which he lacked in his Laurentine villa:

"The one thing lacking amidst all these comforts, not to say luxuries, is running water or springs." 64

But contained in his Tuscan villa:

"The whole basin is watered by never failing springs, and while there is an abundance of water there are no marshes, as the ground water drains away into the river." 65

In the text of nine short pages he describes no less than seven fountains contained on this property which are displayed for human interaction:

1. "...a fountain gently spraying the verdure"
2. "...a fountain in a basin and the pleasant sound of running water from many jets..."
3. "...a marble basin, pleasing to the eye and to the ear..."
4. "...a swimming pool for a cold plunge..."
5. "...from beneath the seat water flows out from small holes but appears to be pressed out by the weight of the bench and its occupants."
6. "...when meals are served here the appetizers and the heavier courses are served from the bank, while the lighter ones are floated on the surface in artificial birds and little ships."
7. "...a small alcove... has a bed and though there are windows on every side still the light is subdued,...it exactly like sleeping in the woods except that you are complexly protected from the rain...while another fountain plays outside." 66

This is the most illustrative source for how a wealthy roman ought to live in pleasure with fountains and pools providing metaphors for instruments, dining tables, illusionary seats, etc. Pliny's letter provoke some thought on the idea of a fountain as a simple water element in the service of man.
The Physical Nature of Water

"The fountain and fire work have the odd distinction of displaying elements of deviating possibilities in a mood of playful benevolence" 67

Water in a space can be displayed as naturalistic or artificial organized as a frame, as spine or as a focus. In its use we constantly jump back and forth between the container and the material. It is one of the few materials which takes the shape of its container and in a transparent way lets the fountain retain a whole and uncompromised self. Additionally, the water itself brings forth itself as an opaque material full, solid and autonomous. These are physical properties of water which Gaston Bachelard addresses in his text Water and Dreams,

"A material element must provide its own substance...primitive philosophies often made its decisive choice along these lines. They associated with their formal principles one of the four fundamental elements. Fire, Air, Water, or Earth." 68

One "...will recognize in water, in its substance a type of intimacy that is very different from those suggested by the depths of fire or rock."69

"The human being shares the destiny of flowing water. Water is the truly transitory element, it is essential, ontological metamorphosis between fire and Earth. A being dedicated to water is a being in flux." 70

Bachelard conveys that water has depth, volume and that it flows. Simple ideas no doubt, yet the implications of reflection and opacity, color, the refraction and other light altering effects of water provide phenomena which are forever dependent on perception, a priori from meaning. The human response which is subconscious is also stronger and precedes thought, memory or meaning.

"Before becoming a conscious thought, every landscape is a oneric experience" related to our subconscious. 71

There is a relationship to the differing approaches of understanding water. The ubiquity of the matter provides for endless uses and images, which are then constructed into tales and myths to travel through history. If one considers all of the mythological gods important because of their association with water, they see that the deity maintain a persona which is a fundamental and subconscious response to some previous use or phenomena, i.e. thunder, earthquakes, springs or a reflection. These tales became attached like baggage to the presence of the recurring phenomena
telling of fear, reverie, purification etc. Water in its simple presence connotes far more than is initially apparent. It is in the spirit of reviving a cultural importance in the utility, materiality, and physicality of water that the consideration of the creation images of water are discussed.

The Waters of Creation
The apparent power, necessity and ubiquity of water were strong reasons for it continual inclusion in all forms of Judaeo-Christian forms of creation:

"God said let there be a vault through the middle of the waters to divide the waters in two and so it was...God made the vault and it divided the water under the vault from the waters above the vault. God called the vault heaven." 72

This is the creation of the world as we know it from the watery mass it was, creating a heaven and earth,

"God said let the waters under heaven come together in a single mass and let dry land appear. God called the dry land 'earth' and the mass of water 'seas' and God saw that it was good." 73

To add to the first dualities of Heaven and Earth, The Earth became Earth and Seas. The last reference of Biblical waters has to do with God creating a garden as a beginning, an idealized representation of the world:

"Yahweh God planted a garden in Eden..., a River flowed from Eden to water the garden and from there it divided to make four streams..." of which two are the Tigris and Euphrates. 74

The Greco-Roman tradition relied on many images of water deities present in the italian gardens. The medium for introducing the mythological Gods is statuary, which is placed in settings of water or as fountains. The meaning of water was within the container. Several are outlined below:

Neptune- "The chief Roman sea god, but since the Romans were not in early times a seafaring people, he was of little importance."75

Poseidon-"A major Greek god of the sea, earthquakes and horses. He seems to have ruled fresh as well as salt waters, particularly those that sprang from the earth. He was to have created springs with a blow of his trident, a three-pronged fish spear. 76
Pegasus- "A winged horse. Pegasus and the warrior Chrysador sprang from the neck of Medusa who was pregnant by Poseidon when Perseus cut off her head. A favorite of the muses, he created the spring Hippocrene on Mt. Helicon with a stamp of his hoof."

Muses- "Goddesses who inspired those who proficient in the arts. They owe their prominence to poets who identified them as sources for inspiration... they were also patronesses"

Nymphs- "Resided in a particular place, object or phenomenon. They were always viewed with a localized sense of being" i.e. trees, springs, oceans, caves.

Narcissus- The boy who fell in love with his reflection in a pool of water and was unable to leave it. He lay beside the spring until he died.

Having so much behind a single image of a fountain, it is understandable that the gardens under consideration contained rich meaning within every element of the composition. It is assumed then that the urban fountain also contained the strong meaning which could support the decoration of an entire piazza in a single gesture. From this background discussion it is apparent that the container of water needs to be related to the use, and symbolism of the water, while the materiality of the water may be exploited through the form of the water itself. Whether the water is in the city or the garden, it relates to a source, in the wilderness as a celebration of the origin and creation of life.
Section Four

Water in the gardens

The final discussion concerns the specifics of the water gardens under consideration. Water is a necessary pragmatic as well as representational device in the garden. It appears and reappears at various stages of the garden in different permutations in differing landscape conditions both structuring (as a foundation for) the garden and as an adornment (in addition to) to the garden. There is an ambiguity then, simultaneous readings of it being primarily a necessity and secondarily a representational move. Since the garden by definition is a systematic intervention of the natural order one would assume that the perception of the ambiguities is intentional. Through investigation it will become apparent that the references used in the gardens begin as individual objects in space with symbolic meanings about water previously mentioned. The use of sequential linking of water elements spatially together along axes causes the water to bring itself forth as referent or structure. Even after the connection is made the other garden elements sometimes jump to the forefront while water returns to background support. This is the pleasure of these Italian gardens.

The structure of this discussion is organized into three sections, Function, Thematics and the Microcosm. The thematic use of water demonstrated at the Villa Adriana is related to the repetitive use of large pools of water which front architecture and run along circulation paths. In the sprawling urban-like environment, the water is a unifying element. While four major areas of the villa have been restored with water to a close appearance of original condition, the discussion will focus on the Canopus Complex.

The Canopus offers an example of the ideas about landscape at the Villa Adriana. It was named after the Canopus Canal in the Nile Delta in Egypt. Symbolically, the idea of a four hundred foot long canal must have been attractive to the Romans, one of the world's premeire hydraulic engineering societies, for its mimetic reference to one of the world's largest rivers. As a destination along one of the main entry axes into the villa, the large canal drew in the guests, dispersed them along both banks and focused them to the architectural terminus of the valley the Seraphuem, which in conjunction with the landscaped banks, closed off the view to the rest of the villa.
The thematic establishment of water as a structure for architecture and landscape is displayed with such subtlety that it is almost hidden. The source of the water is an aqueduct which brings the water down from an underground reservoir at the head of the valley. Connection to this source is made with a small waterfall that enters the Serapheum structure above eye level at the rear of a long room. Water drops to a stone table producing a sound at the entrance of the structure of a much larger waterfall because of the acoustics of the space. The water rushes out towards the canal in a narrow barrel-vaulted room and flows beneath floor level at the feet of persons who would be seated around a semi-circular island and out into a square pool which is on axis in front of the large canal. The shape of the spaces along this water axis repeat the water movement: a vertical, narrow room to echo the waterfall, an apse shaped area to enhance the centrifugal flow of water, and a tall columned portico which would rest and reflect in a small wading pool.

The canopus constructs a paradigm which is followed throughout the Renaissance. There is a display of water at varying degrees of sensation from the rough, to the flowing to still.

**Villa D'Este**

The location at Tivoli was important to the gardens designed for Cardinal Ippolito D'Este. It is located near the ancient villa Adriana where Pirro Ligorio, the designer of the gardens was conducting a so called archaeological investigation or extraction. Beginning in the sixteenth century it was common for the collected Roman antiquities to be exhibited in gardens for public appreciation, to which Ligorio no doubt contributed.82

As mentioned earlier, Villa D'Este may be seen as the epitome of Renaissance water and land acquisition and the display of water is proof that the efforts did not go unnoticed.

"The architectural use of water was something new, reminiscent of Pliny's celebration of Roman aqueducts...or Alberti's promotion of the use of aqueducts a a means of making the hills habitable. Here of water. Water and its play in fountains becomes... the sensible measure of the vitality of the antique world."83

There is not an apparent source of water such as that seen at the Canopus in the hidden vault of the Serapheum. In that case there was a clear progression along
the main axis from a rustic grotto like space to an artificial Nymphaeum like screen to a large horizontal plane of water. At the villa D'Este the only plausible sources on the main axis is in the interior of the villa in the rooms of the piano nobile where there are mural depicting the Cardinal's many land holdings or the fountain built into the wall the way a fireplace would be constructed as a focus. Ligorio's decision to highlight the three main cross axes so heavily against the main axis of approach, so that after finally approaching the top of the hill and the monastery, one is left asking why the path is so long.

One answer is that the main purpose of the garden is not a narrative about the quest of nature in man's life but about the questioning of directions along the path of life.

"The symbolism of the gardens of the Villa D'Este at Tivoli honors the Cardinal for his virtues and for his patronage of the arts that have transformed nature into the wonderful modern Garden of the Hesperides, the mythological equivalent of the Garden of Eden. Hercules to whom the garden is dedicated is the hero...the ancient deity of Tivoli, and the mythological ancestor of the D'Este family." Like Hercules, "...the visitor was forced to choose between diverting interests that prepared him for the Choice of Hercules. 84

This could be expressed in the series of water features which confront the observer as he progresses from the fish ponds in the lower parterre, to the residence beyond the bosco. The stairs one has to ascend contain bubbling railings. The Fountain of the Dragons is a wet stair as stream spray into the center from the inside railings and streams flow down the center of the outside railing against one's movement. After crossing the Alley of One Hundred Fountains, along the main cross axis, one is asked to choose a path right or left of center up diagonally drawn ramps which continue diagonally at the landing above back to center diagonally to just above where one stood originally. At each landing, cut into the hill in typical rustic fashion, there is a grotto with symbolic answers which could advise one of the correct path.

There are three major cross axes. First, on top of the hill which may be read as a cross axis in addition to Ligorio's, (yet without specific narrative intent) is the large promenade upon which the monastery and loggias are placed. It is very urban in its scale and terminates in the open arch of the dining loggia which allows one to be in the city psychologically with a framed view to the wilderness. This is an act of architecture rather than landscape acts as a transition to the wilderness.
The second or middle axis begins at the west with the source of the water from a conduit in the earth. Aligning with this hydrological fact are the geographical poles of the Cardinal's realm. The fountain of Tivoli and its water cascade and grotto walk follow the shape of the earthen valley wall upon which the Fountain of Pegasus is placed, hidden from view. Pegasus is appropriately chosen as source for his mythological powers of creation. The Tivoli Fountain as a vertical plane, shapes a space as mentioned earlier with its curtains of water behind which one passes. This cascade is a geographical reference to the great cascade of Tivoli which is the source of the aqueduct at the other end of the town.

"The hill town of Tivoli is symbolized in the fountain... by the Tibutine Sibyl, the local river gods and cascade which is a formalized version of the great natural cascade... The three conduits of the Alley of the One Hundred Fountains with their boats represent the three local rivers, the albuneo, the

At the eastern end and geographically aligned with reality, is the Fountain of Rome. As shown in the photograph, the fountain is a stage set of a representation of a classical city on metaphorical Tiber River complete with boat. The axis is parallel to the natura bosco and is mostly in shadow. The water is vertical at the Tivoli fountain varied at the Alley, and horizontal at the Rome Fountain. This axis is about discovery, of sources, Pegasus on the hill, hidden; the grotto spaces under the Fountain of Tivoli, and the seemingly endless Alley which through repetition creates the sensation of length.

The lower cross axis is more iconographic and more related to nature than the previous spatial, geographical axis. Anchoring the path of water features at the west is the sculpture/Fountain of Nature or the Water Organ, so called because its valve chambers resonate sounds as water passes over them. Located in this fountain was the allegorical "source": a statue of mother nature which was rendered with many breasts as ancient fertility goddesses have. Juxtaposed along this axis are very still fishponds which highlight the opposite condition of noises and activity produced at the source. These ponds provide a panoramic view across to the Water Organ and create a setting similar to a concert, of active participant and quiet spectator. The planting follows this first move of water as it is in a formal pattern cut low to the ground reserving the tall plantings and trees to be located on the slope beside the Water Organ. Here, the quiet water and formal gardens merge down at the public entry as artificial setting.
The two axes discussed provide opposite examples of active intense and quiet pastoral which align with the iconographic programs of mythological/creational activity and evolutionary passivity. The two axes mimic Villa Adriana: in geographical referencing of the top axis and the open quiet, and still waters of the fishponds juxtaposed to the vertical falling sounds of water. The most varied use of water in a villa garden is at Villa D'Este. These arrangements are perpendicular to the main axis of movement from the public portal at the foot of the garden to the private residence on top of the hill. This allows the garden visitor to interact at varying undetermined points along the axis both at a superficial panorama, as at the eastern most point of the lower axis looking back to the water organ, or at an intense interaction like that received under the oval fountain of Tivoli which provides a curtain of water. This is also an important aspect of centering and recentering which is very reminiscent of the gardens of Villa Adriana.

The Villa Lante

The paradigm set up in the Canopus of Hadrian's Villa reaches its ultimate development at the Villa Lante. As mentioned previously the villa contains a natura bosco and a formal garden. The bosco, which was more of a park signifies both a reference to the past and a foreshadowing of the future parks.

"The fountains in the park, now lost or transformed but identified by the engraving, are associated with the world of nature, such as the Fountain of the Acorns, and the Fountain of the Duck, or are symbolic of virtue, as in the Fountain of the Unicorn and the Fountain of the Dragon. This combination of associations suggests that the naturalistic, wooded hillside of the park is meant to recall the classical myth of the Golden Age when virtuous men lived off the simple offerings of nature and did not have to labour for a living." 86

"Toward the end of the sixteenth century the character of the bosco, or planted woods, began to change. We find not just rows of fir trees, but also isolated fountains ans statues. The woods took on the character of a park....the Villa Lante at Bagnaia stands at the beginning of this shift ..." 87

The juxtaposition of the natural and the artificial is the main theme of the Villa Lante and in the garden, the water elements recapitulate this theme in a narrative which commences at the top of the hill in a rustic grotto and culminates in a still parterre of flowers and water at the lowest elevation. The grotto Fountain of the Deluge is the "source" for the water in the formal gardens. The grotto is built into
the face of a wall and one perceives from within the garden that the rustic bosco beyond has supplied the water. To further enhance the appearance of a rustic cave, the grotto's forecourt is flanked by two rusticated pavilions which supposedly housed Muses, a reference to the introduction of art as a means of transforming the natura into artifice. 88

The next fountain, on axis with the grotto and placed in a court, under trees was the Fountain of the Dolphins.

"The entire fountain was then housed in a domed wooden house covered with vines and provided with benches as a cool shaded place of repose. The low stone bench around the octagonal basin still has small jets of water, which can be regulated by the gardener, like those at Tivoli (at Villa D'Este) to suprise the unwary sitter." 89

The stone bench trick-fountain is also reminiscent of Pliny the Younger's similar bench illusion. The grotto and its vertically falling water is then followed by a less rustic form of enclosure with vertical jets pushing the water up into the air and under the primitive hut. Each step of the garden has a logical order in which all facets of the landscape correspond to the changing form of nature from rustic to formal.

Following the court is a sloping alley between two tall hedges which has a flowing stream of active water running down the center. At the top of this stair a narrow panorama opens up to include the fountain processions down to the formal parterre and through the front portal and into the town. The chain of water is constructed of linked shapes that resemble limbs of a crayfish—a pun on the name of the patron Gambara into "gambero", which is Italian for crayfish. 90 There are two interesting inversions about this fountain, first the sculpture acts as a railing for the stairway and the surrounding hedges act as wall, and second the fish comes out of the water to contain the water instead of the water containing the fish. The chain transforms into a stair at the bottom of its run and displays two river gods whose basins catch the water dispersed by the end of the water chain above. This sloped, dynamic display of water becomes fully horizontal and more sedate in a dining table in the middle of the next terrace.

This table has a water course running down the middle of it referencing the triclinia present in the ancient gardens, where food trays might have been floated from guest to guest. This water display suggests the paternalism alluded to earlier. When approaching the table from below, the water chain seems to drip water
directly into the dining table as if to suggest that the land above is the provider of the bounty of the meal. Conversely, when descending the stairs from above, the water seemingly flows over the edge of the table and out into the city beyond, making Gambara the provider.

The next fountain is a historical reference to Bramante’s Cortile di Belvedere Theater.

"Theatrical productions were another favorite pastime and a place for them was a part of the design of many gardens. At the Villa Lante there is no open area for performances as at the Belvedere Court and the Villa Giulia, but there is instead a reference to th theater... It is composed of rising tiers of semicircular steps, three concave, then three convex, so that the whole resembles a cavea, the ancient theater structure." 91

The parallel transformation of water and vegetation into a more refined and cultivated form culminates in the formal parterre at the bottom of the hill beyond the pavilions which part to the sides to allow the flow of the gardens to reach their climax. The water forms square in the middle of a twelve section parterre and within the square is a circular island reminiscent of The Teatro Maritimo at Villa Adriana. Because of its construction into an ideal Renaissance parterre there is the suggestion that the sequence from rustic park to rustic garden to formal garden is a chronological progression. This also true of the water elements:

"Just as nature has been most controlled, so the water has come to rest in the fish ponds after flowing from the rivers, the seas, and ultimately the flood." 92

The Villa Lante is the culmination of many years of experimentation by Vignola its designer, into the quintessential pleasure garden of the sixteenth century. Its relation to town, to park and to the architectural pavilions which are subordinate to the garden landscape make it a suitable paradigm for the public garden. The elements of the garden are allowed to read as independent elements each constructed in its own world or room, yet are tied into a much larger scheme which at varying times disappears and then reappears. This allows one fountain at any point to be considered against the whole, sometimes telling a whole story at a single time. This is the next area of the use of water which will be considered, the fountain as microcosm.

A single fountain can be understood to represent the whole as a sign or as a
preview of the garden to follow as the Oval fountain does at the Villa Lante. The fountain is located in a small plaza at the main public entry in the seam between the park and the formal garden. The plaza is a part of the of the town below leaking into the wilderness and terminating at a fountain of contemplation. The shape of the fountain is elliptical and through the placement of many muses along its perimeter, there is a suggestion that one should move themselves from side to side to examine the two divisions of park and garden beyond the fountain (see photos). The oval shape seems to gather the two differing landscapes beyond and place them in a single act as if to offer a brief or synopsis of the paths ahead. This is a tendency for the single fountain to act on behalf of the whole as a microcosmic symbol.

It is no suprise then that the statue bearing the water should be the mythical horse Pegasus, whose hooves, striking the rocky outcropping in the pool, seem to produce several jets spraying into all directions. This denotes an act of creation; a will to provide a natural spring in an otherwise dry place. In the Villa D'Este the Pegasus statue was used as a "source", a marking of the specific place where the water made its way into the garden, the garden's spring. Lante's Pegasus at the very front door of the garden is a general symbol of the wilderness as a source and through its minor axis' positioning, points to the literal water source at the top of the hill.

The attempt to read a single fountain as a whole garden in the previous example is possible only as a reduction of the total experience. The experience of arriving at Lante's gardens and seeing only the Fountain of Pegasus would be a very deficient experience. It is an abstract for the real event. The typical detached urban fountain which usually relies on iconography of symbols to convey experience, is deficient as a spatial experience unless it engages another aspect of its context. While it is not very urban, the microcosmic fountain speaking for the whole garden finds perfection in the Nymphaeum at the Villa Giulia at Rome.

The Villa Giulia

The fountain of the Villa Giulia is a very spatial experience primarily because it is located at the very center of its villa sunken down two levels. The designer Ammanati regarded the experience of reaching the fountain as grand and special as the fountain itself. While the isolation of the fountain was important for its
function to Pope Julius III as a place of relaxation, the placement of the fountain as a "source" required the sunken condition. The Pope was in very ill health during the construction of the villa, and was advised by his doctors to obtain waters from the acqua Vergine, the revived Ancient Roman Aqueduct Virgo, which was known to contain powers of healing. Water contained meaning for Alberti in this way:

"For if at any time you find it difficult to compose yourself to rest in the night, only turn your imagination upon such clear waters as you can remember, either springs, lakes or streams and that burning drought of the mind, which kept you waking, shall presently be moistened and a pleasant forgetfulness shall creep upon you, till you fall into a fine sleep."94

The water for the fountain came from this aqueduct and was celebrated as the main focus of the entire villa. The Nymphaeum may be read as the beginning of a thematic progression which centrifugally radiates from the center of the garden in the form of a semi-circle. This form begins in the form of the fountain and the stairs in the nymphaeum and is repeated in the rear loggia of the casino and the exterior court at the Via Giulia's intersection. The fountain here is the whole garden at one level of understanding, and during the design phase of the villa, we are told by Ammanati's manuscripts, the Nymphaeum was more of a figure in the court rather than a second spatial experience in an axial progression.95

The Villa Giulia Nymphaeum is a successful microcosmic fountain because its form, the semi-circle literally radiates outward to engage the context of enlarging landscapes, and its idea, a source of healing, is central to the purpose of the Villa- a retreat. Most importantly though, it is a spatial progression with loggias as mediating ante rooms and secret passageways to exiting stairs, engaging on all levels of understanding the idea of the whole.
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43 Elizabeth MacDougall, p 40
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45 As a side note, the garden was the last completed of the four explored and foreshadows the park like setting of the 17th century Enlightenment gardens.
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<td>The Villa D'Este at Tivoli, Princeton U Press, Princeton 1960</td>
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<tr>
<td>David Coffin ed.</td>
<td>The Italian Garden, Dumbarton Oaks Washington, DC 1972</td>
</tr>
<tr>
<td>John Jakle</td>
<td>The Visual Elements of Landscape, U of Massachusetts, Amherst 1987</td>
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<tr>
<td>J.B Jackson</td>
<td>Discovering the Vernacular Landscape, Yale U, New Haven 1984, pp 9-56, 65-70, 125-130, 139-158</td>
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<tr>
<td>Leo Marx</td>
<td>The Machine in the Garden, Oxford U Press NY 1964 pp 73-360</td>
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<tr>
<td>Elizabeth Moynihan</td>
<td>Paradise as a Garden in Persia and Mughul India, George</td>
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</tbody>
</table>
Diagrams of Italian Villas
The Villa Adriana 118 A.D.- 131 A.D.
The Villa Giulia 1550-1555
The Villa D'Este 1555-1572
The Villa Lante 1565-1575
Site Data and History
You are invited to submit a Proposal for the redevelop­ment of the Albert Thomas Convention Center into a festival marketplace. With the September 26, 1987 opening of the one million square foot George R. Brown Convention Cen­ter, the City of Houston desires to de-commission the 232,710 square foot Albert Thomas making the 23-year old structure available for reuse. The City of Houston intends to lease the Albert Thomas structure and its 6.47 acre site in downtown Houston to a successful Proposer. Further­more, the successful Proposer will construct and operate the Albert Thomas as a festival marketplace, having re­moved a portion of its West Hall for expansion of the City's Buffalo Bayou Park and having also sub-leased the remaining portion of the West Hall to a museum. The structural frame of the rest of the building is intended to remain, yet its face will be rebuilt to provide a celebrative, lively, retail environment. This project offers a unique retailing oppor­tunity.

WHY?

The site is in a major hub of day and night activity. The parcel is located on two city blocks in the heart of Houston's Theater District across the street from 10,518 seats in four theaters, including the newly opened $71-million Wortham Theater Center, Jones Hall, the Alley Theater, and the Music Hall — housing, among other groups, the Houston Symphony, Houston Grand Opera, Houston Ballet, Alley Theater, Society for the Performing Arts, and Theater Under the Stars. Houston, San Francisco, Chicago, and New York are the only U.S. cities with permanent companies in all the major performing arts–grand opera, ballet, symphony, and theater. When combined, these groups attract over 750,000 viewers per year. It also occupies the heart of the 20-block City of Houston Civic Center with 5,000 employees
and high daytime traffic. Moreover, the site is within a downtown walk of over 170,000 workers. The Albert Thomas overlooks Buffalo Bayou, Houston's historic waterfront which becomes the nation's third largest seaport four miles to the east. The $18-million redevelopment of the Bayou's downtown waterfront is proceeding with construction of the 10-acre Sesquicentennial Park adjacent to the site begun in late 1987.

The site is highly accessible. Within downtown, the site is accessible to Interstate 45, the principal north-south (Dallas-Galveston) regional access artery, and Interstate 10, the principal east-west (New Orleans-San Antonio) artery. Moreover, it is flanked by Texas Avenue which becomes Memorial Drive (a major local thoroughfare to Houston's affluent residential communities to downtown). On a different level, the Albert Thomas is linked to Houston's 3.5-mile, weather-protected pedestrian system connecting to over 40,000,000 s.f. of office space.

Parking is available. The Albert Thomas is situated over a city-owned, three-level underground public parking garage covering five blocks and containing over 3,500 spaces. Only 1,600 of these are contracted at present. An additional 3,500 spaces are available within three blocks.

Redevelopment opportunities are real. Only twenty-three years old, the steel framed structure of the Albert Thomas offers a developer the opportunity to create approximately 150,000 s.f. of retail space with minimal effort. The curtain walls may be removed at low cost and the 350 psf live load floor will allow construction without a major new structure. The HVAC central plant may be retained. In all, the Albert Thomas structure presents a redevelopment opportunity at a relatively low cost.

Houston's downtown is comparatively under retailed. With 49.1 million square feet of office space, downtown Houston offers 2.0 million square feet of retail. This may be compared to downtown Dallas with 34.2 million square feet of office and 2.7 million square feet of retail. A new heavy influx of conventioneers -- 1.3 million in 1988 -- is brought by the George R. Brown Center. Its 15 minute proximity to over 500,000 residents adds to the Albert Thomas' appeal as a festival marketplace location. Downtown Houston is the strongest retail opportunity in Houston.
The city-owned Albert Thomas facility was originally developed on a 6.47-acre site on the northwest side of downtown in 1965 as part of the Civic Center. Construction of theaters in the area, along with the then existing Music Hall, has led to development of a major Theater District with the Albert Thomas sitting at the heart. The structure is bounded by Texas and Capitol Avenues, Smith Street, Buffalo Bayou, and bridges over Bagby Street.

Beneath the eastern two-thirds of the Albert Thomas is a three-level, public parking garage which encompasses five city blocks and has 3,500 parking spaces. Entrances and exits to and from the garage surround the Albert Thomas and are located on Texas, Prairie, Capitol, and Rusk Avenues. Access from Interstate 10 west is on Smith Street adjacent to the structure. Access to Interstate 45 is on McKinney Avenue two blocks away, and Memorial Drive exits to Capitol Avenue and becomes Texas Avenue adjacent to the structure. Traffic freely flows even at P.M. rush hour on these streets with service levels not exceeding “C” in any place (1985 data).

Immediately north (northeast) of the structure, across Texas Avenue, is the new city-owned Wortham Theater Center. The $71-million masterpiece opened in May, 1987, and serves as home to the Houston Grand Opera and the Houston Ballet. It has two auditoriums with 2,300 and 1,100 seats, respectively. Its imposing facade facing the Albert Thomas leads to a grand foyer spanning Prairie Avenue. The Ray C. Fish Plaza is in front of the structure.

Flanking the Ray C. Fish Plaza and the Wortham Center to the west is the site of Buffalo Bayou Sesquicentennial Park. Construction on the initial phase of the Park began in November, 1987, and will be completed in March, 1989. The $12-million park is the centerpiece of Houston’s $18-million redevelopment of Buffalo Bayou—a long sought after community goal. The current redevelopment focus stretches from the west side of downtown for approximately one and one-quarter miles to the University of Houston-Downtown at Main Street. Public park land is being constructed along once forgotten banks of this stream where Houston was first settled. (Accompanying material explains Sesquicentennial Park—the product of a national design competition.)
Across Smith Street from the Wortham Center is the Nina Vance Alley Theater—home of one of the largest legitimate theater companies in the country. Designed by Ulrich Franzen and constructed in 1968, the building houses both a 798-seat and 296-seat theater. Sharing the block with the Alley is the RepublicBank parking garage with 1,000 spaces. Above the garage is a roughed out, but undeveloped theater space which may be used for expansion of the Alley in the future. This garage/theater center completed in 1983 is owned by Gerald D. Hines Interests.

Jesse H. Jones Hall houses a 3,001-seat theater which serves as home to the Houston Symphony Orchestra and the Society of the Performing Arts-roadshow production company. Designed by Caudill, Rowlett, and Scott (now CRS-Sirrine) and constructed in 1966, the building is contemporaneous with Albert Thomas. Albert Thomas, the Alley and Jones Hall all face Jones Plaza—a raised, landscaped plaza. The slopes of the plaza have been planted as colorful rose gardens. The plaza is over a portion of the Civic Center parking garage described earlier.

Towering above the south side of Jones Plaza is the RepublicBank Center. Designed by Phillip Johnson, this 56-story office tower of Gerald D. Hines Interests is a prominent, post-modern architectural landmark. Immediately to the west of RepublicBank Center, across Capitol Avenue from the Albert Thomas, is the Bob Casey Federal Courthouse. This 12-story structure constructed in 1964 houses the Internal Revenue Service, federal court rooms for the Southern District of Texas, and other federal offices. Further westward across Capitol Avenue from the Albert Thomas, is a third block of Tranquility Park. Completed in 1978, this grassy block also sits above the Civic Center parking garage.

West of Bagby Street, across Capitol Avenue from the western end of the Albert Thomas, is the Music Hall and Sam Houston Coliseum. The 3,023-seat Music Hall is utilized by the Theater Under the Stars broadway productions, the Houston Pops Orchestra, and numerous road shows. It is connected to the Albert Thomas via pedestrian tunnel. The 8,808-seat Sam Houston Coliseum was constructed in 1935 and often houses concerts, wrestling matches, high school graduations and religious services. Both structures were designed by noted architect, Alfred C. Finn of Houston.
AERIAL VIEW OF DOWNTOWN HOUSTON
<table>
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<tr>
<th>PUBLIC AREAS</th>
<th>Square Feet</th>
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<tr>
<td>Lobby/Ticketing/Visitor Services</td>
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<tr>
<td>Gift Shop Sales</td>
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<tr>
<td>Auditorium</td>
<td>2,900</td>
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<tr>
<td>Classrooms</td>
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<tr>
<td>Exhibits and Public Circulation</td>
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<td><strong>TOTAL</strong></td>
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<td>Exhibit Support</td>
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<tr>
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<tr>
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<tr>
<td>Administration</td>
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<tr>
<td>Gift Shop Support</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>24,650</strong></td>
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**TOTAL**                                         **60,400**
Conclusion
Jury Comments


There was an agreement by all jurors that the thematic investigation and use of precedent was beneficial to the project's success. The criticism centered around the architecture's desire to create spectacle where water could have been employed.

The tilted grid layering added a degree of spectacle which was unnecessary... Jones

The actual spectacle could have been through huge demonstrations of the materiality of water, i.e. waterfalls, rainbows, or mist... Balfour

More could have been done to play up the mechanized aspect of water. The notion of man's ability to control or conquer water is an interesting subject which could have been exploited... Maruszczak

Author's Note:

The placing of the habitat tanks eight feet from the gridded frame was to allow exposure the piping of water from tanks to filters to labs.

The rotated pavilions' contextual reference to the landscape and buildings of the bayou could have been more literal in their establishment of a relationship. Three dimensional figure or lines marked on the ground could have assisted in this reading... Jones

The distinction between building and landscape could have been more ambiguous. As an issue in nature and artifice, the division could have been clouded in a vine covered frame or a fragmentation of the frame... Balfour

The interior and exterior narratives could have been more ambiguous, ie the live fish inside and the fossilized fish outside could have been given more similar environs to induce a possible re-creation of the prehistoric creatures... Waldman.