THE ITALIAN RENAISSANCE GARDEN

From the Conventions of Planting, Design, and Ornament to the Grand Gardens of Sixteenth-Century Central Italy

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CHAPTER 1

Nature and Culture in the Garden

The Renaissance universe is hierarchical, with God at the summit, human beings in the center, nature below, and each part related to the other. The natural world was perceived in terms of its usefulness for human needs: plants and animals provide food and medicine.[1] They also reflect human traits, virtues, and beliefs, and therefore serve as symbols — heraldic, moral, philosophical, and religious. At the same time, the visible world corresponds with the divinely created cosmos; the microcosm reflects the macrocosm. To know this world is therefore also to know God. Finally, some forces in nature can be manipulated and controlled to benefit human life, while others remain uncontrollable. All these aspects of mankind's relationship with nature were exhibited in Renaissance gardens, in the planting, design, and sculpted ornament, but also in earth-moving, hydraulics, and water-powered devices.

In antiquity as in the Renaissance, the interaction of human culture and the natural world was expressed through the paired concepts of art and nature.[2] The dialogue between art and nature was by no means limited to gardens, but was particularly appropriate to them. There the raw materials provided by nature — the terrain, trees, plants, flowers, stones, and water, with their infinite variety of forms, colors, textures, and scents — were selected, cut, shaped, and organized by art. The two terms were united as well in the artistic theory of the Renaissance, which could be applied to gardens as much as to painting, sculpture, and architecture, and which required that art imitate nature. Since nature consisted of more than raw materials and shapeless masses, the task was not so simple. Nature was also conceived as ordered, a reflection of a cosmic order; and in imitating nature, art must imitate not only nature's outward appearance, but also its underlying order.[3] The agricultural metaphor used in the sixteenth century to explain how art brings out the order in nature is a felicitous one for understanding gardens: nature produces better fruit if planted and cultivated.[4]

A dialectic, a flow back and forth, best characterizes the relationship between art and nature, especially in gardens, as it was articulated throughout the sixteenth century. Created literally out of nature, gardens resemble cut gems and stones, about which a contemporary remarked that they were neither all nature nor all art, but had both parts, each helping the other.[5] The famous sixteenth-century naturalist Ulisse Aldrovandi praised one artist's studies of plants and animals as done with such artifice that they seemed produced and generated by nature itself.[6] Even more in a garden the familiar notions of artistic creation acquired particular subtleties and ironies. The interaction was seen as playful, subtle, and even deceptive, in which the separation of the two elements was deliberately confounded. Garden design rested on the principle that art imitates nature; but in the playful spirit of these realms of green, nature also "imitates her imitator art."[7] A valley made by nature seemed instead made by art; a cave presented a puzzle: was it carved from the mountain naturally, or manually?[8] In the eyes of

contemporaries, art's intervention was not always distinguishable from nature's creation, and this confusion was manifest throughout the garden.

Poems, letters, plays, and dedications enthusiastically recount the different modes of interaction between art and nature, which above all work together, mingling their respective beauties, harmonious in their aims. They are spurred on by a friendly competition, a lively contest in which each puts forth its best in an attempt to outdo the other. In twentieth-century criticism, Renaissance gardens have been interpreted in terms of man dominating nature, but this reflects our current attitudes rather than those of the past.[9] The words of contemporaries instead describe a match of equals, as in the example of a tabletop of precious stones, in which it was dazzling to see "how art and nature compete in a certain way to bring forth the most highly valued beauty and the most supreme artifice."[10] A garden similarly manifests the rivalry between its two essential aspects, not the victory of one over the other, since "life-giving nature never wins, nor art either."[11] Art might seem to triumph over its competitor, as at the Villa d'Este at Tivoli, where "nature agrees to confess to having been surpassed by art," or so an admirer claimed in his compliment to its owner and creator, Cardinal Ippolito d'Este.[12] In the game they played, however, art could excel only by a most successful counterfeit of its opponent, disguising the artful under the seemingly natural. A contemporary thus admitted that where art and nature are incorporated, united, and reconciled, they produce stupendous things.[13]

Although the interaction of art and nature defines much of Renaissance culture, only in gardens is their conjunction, or incorporation, named. Two writers characterized the garden as "a third nature": first Jacopo Bonfadio in a letter of 1541 describing the gardens on the shores of Lake Garda, and, soon after, Bartolomeo Taegio in *La villa* (1559), a tract on life in the country.[14] Bonfadio's words explain the symbiotic relationship between art and nature in the garden, each participating in the character of the other so that "nature incorporated with art is made the creator and connatural of art, and from both is made a third nature, which I would not know how to name."[15] Nature and art are united into an indistinguishable whole, in which nature becomes the creator of art and shares the essence of art. Together they produce something that is neither one nor the other, and is created equally by each.

The idea of a third nature grew out of established notions of art and nature, and recalled specifically a related concept of a second, or another, nature. This has roots in antiquity where the expression was used to describe human modification of the natural environment. Cicero explained the process in *De natura deorum*: "We sow corn and plant trees. We fertilize the soil by irrigation. We dam the rivers, to guide them where we will. One may say that we seek with our human hands to create a second nature in the natural world."[16] A similar phrase was repeated by Sebastian Münster in his mid-sixteenth-century *Cosmography*, in which he remarked that the earth had been so changed from its original state — by cultivation, settlements, villages, fields, and so on — that it could be called another earth.[17] The notion of a second, new, or another nature had a wide currency in the Renaissance, with several related meanings. For example, in a letter of 1537 to Michelangelo, the writer and critic Pietro Aretino wrote that 'in your hands lives hidden the idea of a new nature."[18] Andrea Palladio in his treatise on architecture of 1570 spoke of an architecture that is another nature, and in other contexts in the sixteenth century, poets, poetry, art, and alchemy were all described as a second or another nature.[19] Expressions of man's control over nature's forces, or of surpassing nature in painting, are familiar in Renaissance thinking, but they represent one part, not the whole, of the contemporary world

view. Bonfadio's explanation of gardens as a third nature clearly differentiated them — as a product of nature as artist, acting on art, as well as of man modifying nature.[20] Other contemporaries found equal difficulty in naming the result of this interaction, which was both a "natural artifice" and an "artificial nature."[21]

Contemporary metaphors for gardens express in playful and poetic ways that the garden is about how art shapes nature, and nature provides the challenge for art. The garden setting, water, and local geography all become the theme of art's shaping nature at a specific site into a garden. Art imitates nature by repeating artificially what nature put there naturally. In more precise ways, the design, planting, and ornamentation of the Italian Renaissance garden all exemplify the notion of a third nature. This is all the more obvious once the original state of the garden has been reconstructed, for then the control, order, and geometry that betray art's hand are softened and blunted by nature's flourishing vegetation. The artificial replication of nature is manifest throughout, in topiary, natural-seeming grottoes, man-made rainstorms, fountains in which water flows from overturned vases and wrung tresses, and in unifying themes which allegorize the passage of water in nature.

In recreating nature, the garden also revealed the laws of nature behind its material appearance, and thus reflected the belief in the correspondence between things visible and invisible which was central to Renaissance thought. The divine harmony of the universe was echoed in the harmony created through human art in buildings, pictures, households, governments — and gardens. Jacopo Bonfadio, who described the gardens on Lake Garda as a third nature, went on to suggest their correspondence with the infinite stars above, "if one must believe that the things down here have a sure ratio with those above."[22] In the arts, this ratio between microcosm and macrocosm was expressed through mathematical perspective, proportional relationship of parts, symmetry, and geometric forms. The order in the garden, achieved through similar means, likewise reflects and reproduces a cosmic order. Precisely this ordering and regularizing, imposed on traditional garden practice, is what distinguished the gardens of the fifteenth and sixteenth centuries from earlier ones, and in this also resides their affinity with other arts and with the culture that produced them.

Because the ordered microcosm reflects the macrocosm, the garden was an ideal vehicle to acquire knowledge of the divine order, a step by step process since all things in the visible world were understood as links in a chain leading to the divine. In his defense of country life, Bartolomeo Taegio explained that in the garden one could come to know all the elements of nature, the animals, vegetables, and minerals, and the four elements, air, earth, fire, and water, and thus rise through the spheres and finally reach God.[23] However, these philosophical ideas were applied to gardens only in a casual and unsystematic way; they express commonly held notions about the universe, not any particular philosophical school or chronological moment.

The garden was indeed a summation of contemporary knowledge of the natural world, a microcosm of nature in a literal sense, although there were enormously greater implications to this in the second half of the sixteenth century, when the known natural world had expanded dramatically. The idea that a garden should be a catalogue of nature began before the plant explosion, however. In the second quarter of the fifteenth century the humanist, mathematician, and architect Leon Battista Alberti declared that in a garden should be planted "every fine fruit that exists in any country."[24] One of the most famous fifteenth-century gardens, a fictional one in Francesco Colonna's *Hypnerotomachia Poliphili*, published in 1499, more than fulfilled Alberti's requirement since it

contained "all the delights that were scattered throughout the universe, so that one could come to know all that had been created."[25] Recommendations for garden planting in the later sixteenth century suggest that the idea of a garden as representative of all nature remained an ideal that was to a limited extent carried out in practice.

The encyclopedic planting of the garden was motivated by the same desire to collect and catalogue all existing specimens that characterized the flourishing activity of Renaissance naturalists. Both were inspired by two things: the rediscovery of ancient treatises and the profusion of new plants entering Europe from the Levant, as well as from Asia, Africa, and the New World. Among the far-reaching implications of the classical revival were the translation and printing of Greek and Roman texts which laid the foundation for the advances of the sixteenth century in the natural sciences and technology.[26] These ancient works stimulated enthusiasm for the natural world as well as a more scientific descriptive method and the prerequisite observation. Renaissance naturalists read the surviving works of Theophrastus, Pliny the Elder, Galen, and especially Dioscorides, which classified plants according to their pharmacological uses and which had been the basis of herbals through the Middle Ages. They compared the descriptions in these texts to their own observations of plants, noting errors and the need for numerous additions.

As more plants became known, the popular herbals were radically expanded with increasingly detailed and accurate descriptions of specimens and correspondingly sophisticated illustrations. However, Renaissance compendia as well as their primary antique models were gathered under the rubric of "simples" — plants, or strictly speaking any substance, vegetable, animal, or mineral, that had some medicinal use.[27] They culminated in a commentary on Dioscorides' *De materia medica*, in effect a comprehensive inventory of all known plants, by Pietro Andrea Mattioli, personal physician to Emperor Maximilian II. Enormously popular, the book was first published in Italian in 1544 and ten years later in Latin with woodcut illustrations, then was repeatedly enlarged and translated into several languages.[28] The principal text, however, remained Dioscorides' treatise, to which commentaries were added; the logic of the organization and the underlying purpose of recording the usefulness of plants continued unchanged.

A profound impetus to the flurry of activity in observing, describing, and cataloguing plants was provided by those not discussed in ancient texts, since in less than one hundred years more than twenty times as many plants entered Europe as in the preceding two thousand years.[29] New plants arrived throughout the Renaissance, but especially in the second half of the sixteenth century. Most found their way to Italy from Turkey via Vienna, or from the New World through Portugal. Others became known through a feverish international exchange of new specimens, a learned correspondence among naturalists throughout Europe, voyages of exploration west or east, such as Pierre Belon's with the specific aim of investigating flora, and books devoted exclusively to exotic plants.[30] In 1583 Ulisse Aldrovandi possessed 7,000 drawings and dried specimens of plants. Among the newly arrived was crown imperial, the earliest fritillary known in Italy, a drawing of which he sent in 1578 to Francesco de' Medici, grand duke of Tuscany, an enthusiastic amateur of the natural world.[31] In exceptional cases a new plant was the rediscovery of a legendary one, for example the *pomo d'Adamo*, or Adam's apple (fig. 1), which arrived in Italy from Portugal, a bumpy-skinned citrus fruit believed to be the forbidden fruit that Eve plucked from the Garden of Paradise.[32] This and other specimens were appended to later editions of Mattioli's text and also brought to contemporary gardens immediately

1. Adam's Apple, from P. A. Mattioli, *Commentarii*, Venice, 1565, Dumbarton Oaks, Trustees for Harvard University.

after their arrival, so that the encyclopedia of word and image was matched by the living one in the garden.

Out of the conflict between authority and experience, the classical texts and the overwhelming number of new plants, emerged the beginnings of a scientific study that led eventually to modern botany. The first botanical gardens in Europe were founded, in Pisa in 1543 followed by those in Padua and Florence two years later. They were accompanied by chairs of botany at the universities, attempts at scientific classification, and the introduction of the herbarium, a collection of dried specimens to record the appearance of plants accurately.[33] But put in these terms this information is somewhat misleading. In Italy in the sixteenth century they were called gardens of simples (and in England physic gardens), not botanical gardens; the word "botanical" was little used before 1600, and the modern concept even later.[34] Gardens of simples were connected with a university or other institution, and were generally under the directorship of the holder of the chair of "botany," or the study of simples. The guiding principle was still ostensibly and primarily the pharmacological use of plants, although by the end of the century this was an outmoded concept.

Gardens of simples were informed by the culture's view of the natural world as useful to humans, and so too were private gardens. The distinction between botanical and private garden was one of variety, not essential concept. Sixteenth-century botanical gardens displayed many more species, especially rare and exotic ones, but, as we shall see, the plants were organized in the same categories, ordered with similar principles, even the precise designs, and embellished with the same kinds of ornaments, both sculpted and natural, that were made for princely private gardens. Throughout the Renaissance, as in the Middle Ages, there was no strict distinction between utilitarian and pleasure gardens: a garden was meant for both use and enjoyment.[35] In his treatise on villas, Anton Francesco Doni, a sixteenth-century social satirist and idealist, presented a hierarchy of five estates, from the most élite to the farmer's, the grandest of which contained greens to eat as well as simples to view and to use for medicine.[36] At one of the most lavish sixteenth-century gardens, that of the Villa d'Este at Tivoli, one contemporary thought particularly worthy of note the noble fruits which were presented to the pope, salad greens and grapes eaten by the court in residence, and a local Tiburtine grape enjoyed by both princes and cardinals in Rome.[37] This is not to deny that some gardens were more strictly utilitarian and others more intended for pleasure, but to clarify the evident fact that the plant world was perceived, studied, and appreciated as both useful and pleasing, and that some, if not all, of the plants in every garden had another use.

For this reason, information on gardens is contained in agricultural treatises. These conflated the traditions of ancient Roman tracts on farming by Varro, Columella, and Palladius, and of medieval herbals with lists and descriptions of plants, together with Piero de' Crescenzi's popular handbook (written in the early fourteenth century and reissued throughout the Renaissance), which provided practical information on plants and planting as well as a characterization of three gardens of different sizes.[38] Renaissance treatises on agriculture, produced throughout northern and central Italy, made little distinction between garden types while setting forth the division of planting, fundamentals of maintenance, and details such as hedge materials and heights, in addition to cataloguing all the plants on the property.

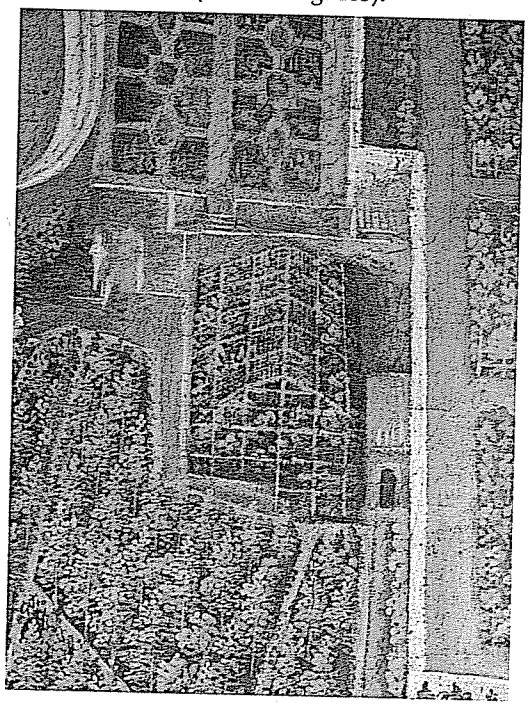
Interest in the plant world concerned more than simply its beneficial properties, however. In his commentaries on Dioscorides, Mattioli recounted not

only the usefulness and physical characteristics of plants, but also their traditional associations and their history as known from ancient literature. The symbolic significance of plants guided the selection of specimens in the garden as well. In his list of trees in the garden of a contemporary, Taegio appended an adjective to each, some descriptive of a physical characteristic, others of a moral one. For example, the oak is robust, the ash tall, but the linden is incorruptible and the willow humble.[39] An extreme expression of this anthropocentric attitude toward the natural world is the doctrine of signatures, which asserted that each plant bore an outward sign of its particular medicinal properties.[40] Still, there is no evidence that the doctrine played a role in the planting or design of gardens.

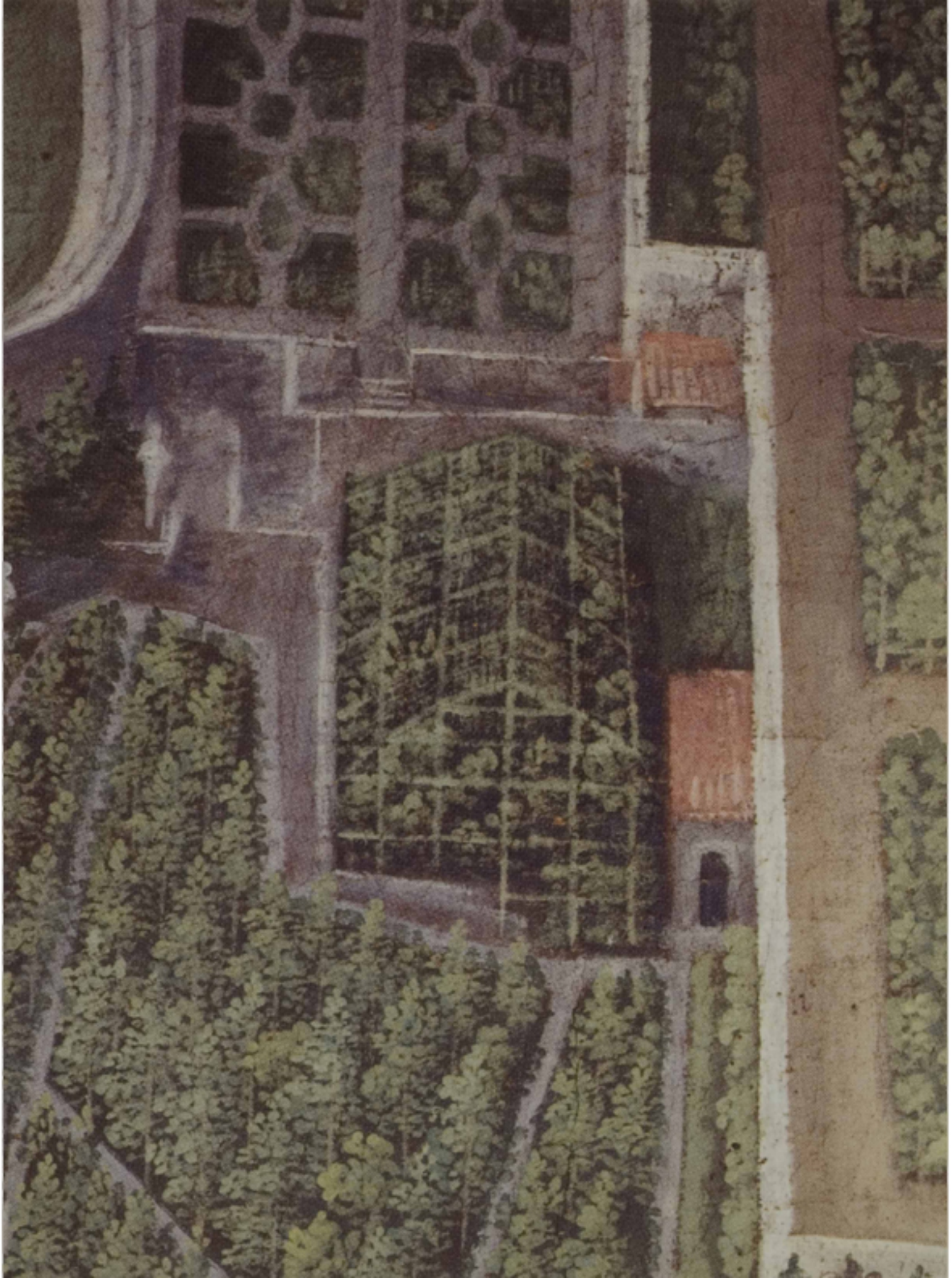
The transition from the concept of simples to that of ornamental plants was a long one, which, like the science of botany, required a separation of the human and nature. But already in the last years of the sixteenth century a treatise by Agostino del Riccio with an elaborate proposal for an ideal garden specified flowers, not herbs or simples, and Vasari the Younger's garden design for the country palace of a prince included separate areas for flowers and simples.[41] Interest in the new flowers, which had no recognized uses and were unknown to the ancients, led gradually from herbal to flora, but only in the seventeenth century were flowers rather than simples catalogued in what was called a florilegium, which we might term a horticultural manual.[42] Also significant is the explosion of plant breeding which began at the end of the sixteenth century and marked a new phase of human interaction with nature.

An essential corollary to the interest in descriptive accuracy, and a prerequisite of the new books on flowers, was the concern of artists to produce equally precise representations. Not surprisingly, their work might be found in a garden retreat, such as the early sixteenth-century Villa Farnesina, where in Giovanni da Udine's paintings "all the kinds of fruits, flowers, and leaves, season by season . . . even the flowers of the elder, of the fennel, and of the lesser plants are there in truly astonishing perfection."[43] Later in the century the art of naturalistic representation was practiced by specialized artists such as Jacopo Ligozzi, whose drawings of both plants and animals were solicited and collected by Aldrovandi.[44]

The encyclopedia of the natural world in the garden included fauna as well as flora. These too could be found in both living species and painted effigies, such as Ligozzi's paintings of fish in one of the grottoes of the Villa Medici at Pratolino. No garden was complete without aviaries and fishponds, furnished with representatives of the variety of birds and fish in nature. The aviary at Pratolino (fig. 2) recreated a natural habitat for garden warblers, goldfinches, and other ornamental and songbirds, in a large iron enclosure, densely planted within and covered with netting.[45] Others were stocked for the popular sport of bird-hunting, with thrushes in particular. Animals, both domestic and newly discovered exotic ones, were also gathered in the garden. They might be represented by painted and sculpted facsimiles, such as the menagerie of horse, wild ox, fallow deer, dromedary, wild boar, angora goat, and leopard, among many other animals, in the grotto of Cosimo de' Medici's garden at Castello (fig. 3). In the 1570s and 1580s, Cosimo's son Ferdinando, cardinal and later grand duke, sheltered instead living lions, tigers, bears, ostriches, and other wild animals in his garden in Rome.[46] The collecting and cataloguing impulses behind the presence of birds, beasts, and fowl in the garden likewise informed the many-volumed encyclopedias of the second half of the sixteenth century, published by Aldrovandi in Italy, and by Rondelet, Belon, and Gesner in France and Switzerland.[47] These also had their basis in Pliny and Aristotle, which were



2. Aviary, from Giusto Utens, Villa Medici, Pratolino, detail, 1599, Florence, Museo di Firenze com'era. (Detail of fig. 103).



updated with all the new animals to be seen in Europe, and they too were equally concerned with scientific description and with the habits, temperament, character, social uses, and literary history of each.[48]

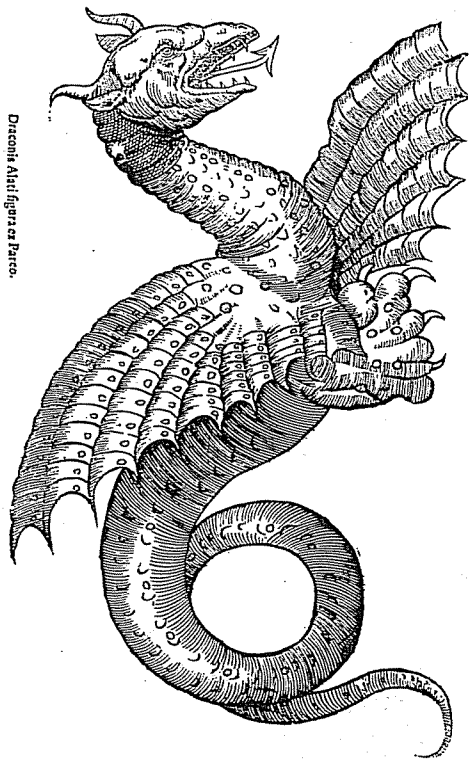
In addition, Aldrovandi's and Gesner's zoological works unhesitatingly gave equal treatment to mythical creatures, such as the unicorn, dragon (fig. 4), basilisk, siren, centaur, and other sea monsters, which figured prominently among the sculpted replicas in the garden. Belief in these creatures was subject to ironic wit in a mid-sixteenth-century satire on the most notable and monstrous things of Italy, in which passengers on a sea voyage were met with hybrid tritons and nereids in addition to lobsters (in the vernacular, sea elephants) and seals (literally sea calves).[49] More serious attention was paid to the unicorn, whose existence was hotly disputed, above all because of the reputed property of its horn as an antidote against poison. Arguments on each side were reasoned in a slim volume by Andrea Bacci, *L'alicorno*, published in Florence in 1573. Princes of Europe persisted in their tenacious belief: in 1569 Cosimo I de' Medici, grand duke of Florence, purchased one of the infamous horns at an exorbitant price.[50] These fabulous animals similarly numbered among the collections in gardens, where they symbolized virtues of the owner or metaphorically expressed aspects of nature.

Minerals and stones received similar attention, spurred on by recent developments in mining practice. Georg Agricola's treatises on geology, mineralogy, metallurgy and mining, published in 1546 and 1556, were the first to describe minerals in detail and to catalogue them in a scientific way.[51] This too was relevant to the garden since some of the illustrations to Agricola's most famous text, *De re metallica*, were reproduced in one of the grottoes of Francesco de' Medici's villa at Pratolino, and the collection of animals in the grotto at Castello was carved out of various colored stones, some just recently discovered.[52] The two concerns, gardens and stones, intersected in the person of Agostino del Riccio, the eccentric Dominican monk who wrote an agricultural treatise rich with information on plants and gardens and another on stones;[53] both of these reveal his fascination with the variety in nature and his need to know and to order it.

All these aspects of the natural world were brought together in the garden of simples at Padua, which displayed not only plants but all the marvels of nature, among them minerals, soils, stones, precious stones, fish, sea animals, sponges, corals, land animals, and birds.[54] A veritable museum of natural history, the Paduan garden of simples reflected what was implied, if only informally and sometimes playfully carried out, in every Renaissance garden. In this sense the garden could fulfill the requirements of a contemporary program of study:

> And as for the knowledge of Nature's works, I should like you to give careful attention to that too; so that there may be no sea, river, or spring of which you do not know the fish. All the birds of the air, all the trees, shrubs, and bushes of the forest, all the herbs of the field, all the metals deep in the bowels of the earth, the precious stones of the whole East and the South — let none of them be unknown to you.[55]

This agenda, which comes out of Northern Europe in the early sixteenth century, part of Rabelais's satire on the humanist world in *Pantagruel*, accurately reflects the concerns of the time and is valid for Italy as much as for the author's native France. The natural world was a part of contemporary culture, a requirement of the educated, and not exclusively of naturalists or humanists steeped in classical literary culture. Ulisse Aldrovandi corresponded with rulers, among them Ranuccio I, duke of Parma, intellectuals such as Fulvio Orsini, priests, monks,



4. Dragon, from U. Aldrovandi, *Serpentum et Draconum historiae*, Bologna, 1640.

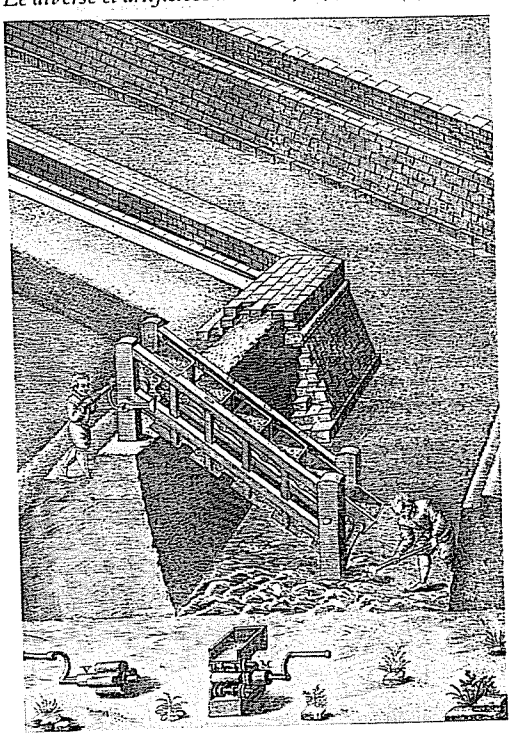
3. Grotto of the Animals, Villa Medici, Castello.

and country gentlemen.[56] The interest of the Medici in the natural world is well known, but not that it included an exchange of seeds, rare plants, and drawings between Aldrovandi and the Grand Dukes Francesco and Ferdinando.[57]

With such an accurate knowledge of the natural world, one would be well equipped to embark on a quest for higher knowledge, intimated in the garden's ordered layout of all the variety of nature. For this reason a garden, like a theater, machine, or city, was used as a metaphor for a closed but encyclopedic system. Recently some scholars have suggested that there is a relationship between the garden and memory systems, especially memory theaters.[58] However, the similarity between the two structures lies only in the fact that the garden was conceived as a finite inventory of the natural world to which another significance could be attached.

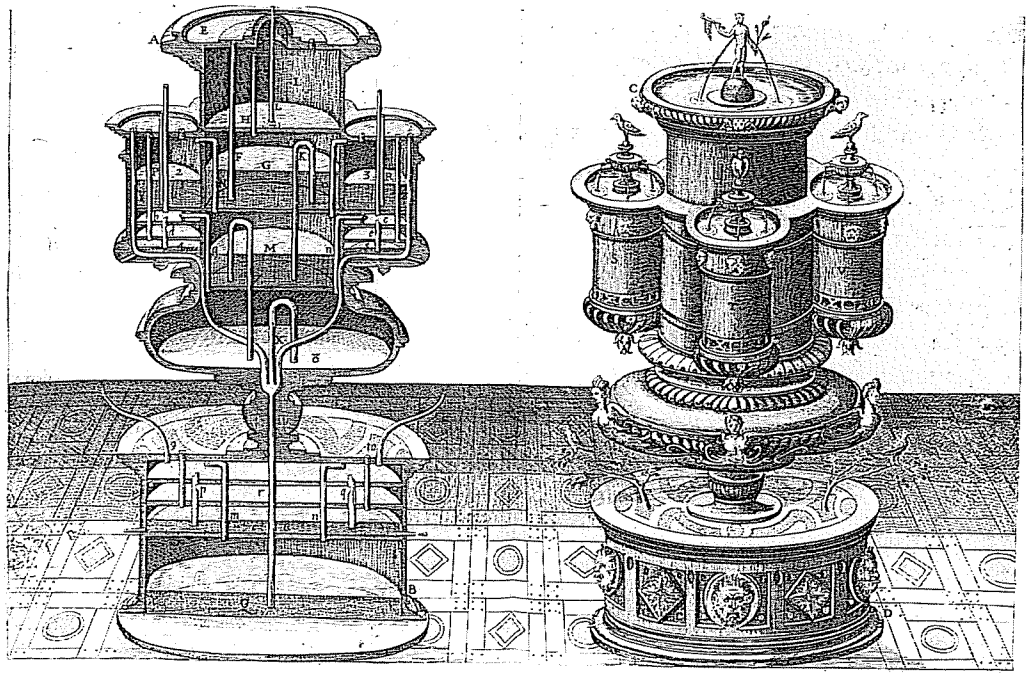
Garden design was determined by the aim of displaying variety within an ordered structure, but was also directly related to the ability to manipulate nature. Again the model of antiquity was an important inspiration for Renaissance mechanics. Revived interest in the texts of Archimedes, Aristotle, and Vitruvius was accompanied by an awareness of so many more objects in the world, [59] as well as by a fascination with how they worked. In this case the preoccupation of Renaissance engineers with hydraulics, especially pumps, was fueled by the enormous practical problems of land drainage and irrigation. The pressing need to increase the supply of drinking water inspired great interest in the manuscript of Frontinus on the aqueducts of ancient Rome, discovered in the late fifteenth century.[60] Mechanics was first introduced into the university curriculum at Padua in the 1560s,[61] and a spurt of treatises on machines emerged in the second half of the century. One of the most widely known, *The Diverse and Ingenious Machines* by Agostino Ramelli, first published in 1588, illustrates 110 devices for raising water.[62] These same machines were used to lift water and in some instances bring it to gardens, especially those on the hills around the center of Rome, high above the water level.[63]

5. Earth-Moving Machine, from A. Ramelli, *Le diverse et artificiose machine*, Paris, 1588.



Other practical problems of creating the great terraced gardens of the later sixteenth century were addressed by Ramelli's inventions. They included ten cranes, seven machines for dragging heavy objects, and two devices for earth-moving, one of which (fig. 5) numbered among the earliest examples of the endless chain employed for the raising of solids.[64] Garden ornamentation also came within the sphere of interest of engineers and their treatises. Ramelli's published inventions included designs for water organs and for fountains with singing birds and moving parts (fig. 6). The illustration in plan and cross-section reveals a complex inner structure of compartments and a network of pipes. These operated through the pressure of water on air, forcing the air through the pipes to produce a harmony of birdsong and parts that moved at intervals. The scale and variety of invention are new; the mechanical principles multiple, but not complex. Innovative also is the format of the book: illustrated with the same interest in detail and accuracy as the natural sciences, the machines could be understood and recreated from the full-page images, while the accompanying text explained their functioning and the mechanical theory on which they were based.

These popular hydraulic devices were inspired by the *Pneumatics* of Hero of Alexandria, which became increasingly well known in the fifteenth and sixteenth centuries through translations from the original Greek into Latin.[65] There followed a spate of Italian translations in the late sixteenth century. An Italian edition of Hero's preface on vacuums was dedicated to Bernardo Buontalenti, the architect and designer of the fanciful automata at Pratolino, who was himself credited with the invention of a perpetual motion machine, an impossible dream

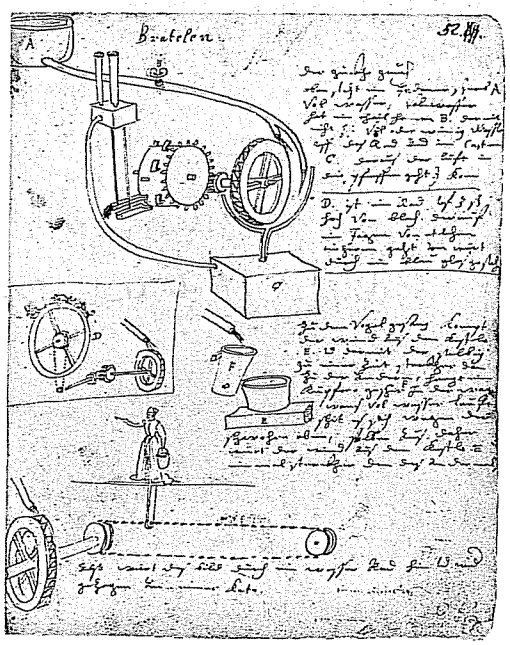


6. Fountain with Singing Birds, from A. Ramelli, *Le diverse et artificiose machine*, Paris, 1588.

much in vogue.[66] What Hero invented on a small scale — playthings worked by air, water, and steam — Renaissance engineers expanded in size and brought outside to the garden.[67] The sixteenth-century devices were more complex, employing the gears and pulleys that engrossed their contemporaries. They were also in some cases more efficient machines, activated by water power rather than manually, by pumping air or playing a water organ.

In the gardens, water-powered moving statues, music-making figures, crashing noises of artillery, and water tricks (unexpected sprays triggered by springs or levers) all aroused much more than curiosity. These devices captivated contemporary visitors, such as the Frenchmen Michel de Montaigne and Nicholas Audebert, whose accounts of the water organ and singing birds at Tivoli describe in detail their hidden mechanisms.[68] In his satiric novel, *The Unfortunate Traveller*, Thomas Nashe sent his protagonist on the ritual trip to Italy, where he saw one of the wondrous fountains with singing bronze birds and discoursed at length on the pipes, bellows, and wheels that set the whole in song and motion.[69] Others, such as the German architect Heinrich Schickhardt, drew the gears and pulleys that drove the famous automata in the grottoes at Pratolino (fig. 7).[70] These were understood as evidence of technological progress and their preponderance in the gardens and enthusiastic reception suggest that they symbolized a significant achievement of the age.

7. Heinrich Schickhardt, Mechanisms for Automata at the Villa Medici, Pratolino, 1600, Stuttgart, Württembergische Landesbibliothek Cod. hist. 4° 148b, f. 52r.



That achievement was invariably viewed with respect to the ever-present models in antiquity, as is evident in the spirit of competition that pervades contemporary accounts. In the discussion of gardens the accomplishments of the ancients invariably provided the standard, and the conclusion was always, as at Tivoli, that antiquity had "but little in comparison with the modern things to be seen today, surpassing in their way all the most excellent the ancients ever had."[71] This superiority was most clearly manifested in hydraulic devices, which were a supreme example of mankind's ability to harness nature through the art of mechanics. In the case of life-size moving figures animated by water power, nature itself provided the force to give life to inanimate objects. In his effusive tribute to the Medici estate at Pratolino in 1586, Francesco de' Vieri praised and interpreted its marvels, concluding with a comparison between ancients and

8. Giovanni Guerra, Pan and Syrinx at the Villa Medici, Pratolino, 1604, Vienna, Graphische Sammlung Albertina.

moderns in which hydraulic achievements figured prominently. The same parallel had been made over a century earlier and in the intervening time had probably become a commonplace.[72] Among De' Vieri's examples was the statue crafted by Daedalus, the legendary sculptor and inventor, which was said to move by itself without stopping. This was surpassed by one of the automata at Pratolino representing the woodland god Pan (fig. 8), because he not only got up and sat down again, but he also played his panpipes and moved his eyes and whole head. In his final demonstration, De' Vieri matched the ancients' ability to lift weights with Renaissance machinery of war, architecture, and medicine, but also with the stupendous artifices of the garden — statues that turn, play instruments, and shoot water.

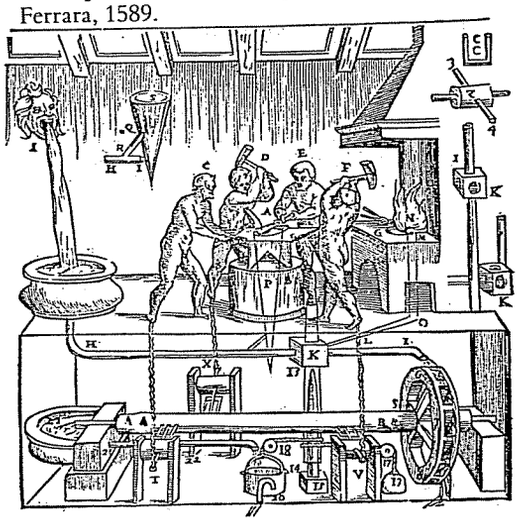
The automata at Pratolino were based on those in Hero's *Pneumatics*, but they resemble more closely the devices of greater complexity and imaginativeness that Giovanni Battista Aleotti appended to his first Italian translation of Hero's text, such as the iron-workers (fig. 9). One of them turns to heat iron in a forge, then each hammers in sequence. Sparks of water fly from their hammers and water bubbles out of the forge, creating the sounds of molten metal. In addition, Aleotti provided the design, construction, and maintenance instructions for a four-cylinder force-pump, which would supply the water for his automata.[73]

Antiquity presented a challenge not only in the investigation of plants, animals, and machines, but through its own cultivated gardens. One of the implicit aims of Renaissance garden designers was to recreate the gardens of the ancients and, in the spirit of competition that infused the age, to surpass them. Knowledge of ancient gardens was scattered but altogether substantial, derived from literary sources and from vestiges of architecture and sculpture at garden sites. Classical literature abounds with discussions of nature, fictional gardens, and life in the country, much of which is echoed in Renaissance words and gardens. Specific information about actual estates could be gleaned from Varro's description of his elaborate aviary, Pliny's scattered remarks in his *Natural History*, lengthy accounts in letters by Pliny the Younger (nephew of the Elder Pliny) of his own two gardens, and references to Nero's Golden House by Suetonius and Tacitus.[74] The remains of the imperial gardens in Rome and Hadrian's villa at Tivoli were also studied and reinterpreted.

From the ancients came the inspiration for planting trees in ordered rows, entwining them with ivy and vines, grafting trees, clipping box into animal and other shapes, devising tree houses and decorating grottoes, equipping outdoor dining tables with water troughs in which to float plates or cool wine bottles, imagining automata, populating gardens with the gods of pagan mythology, and terracing hillsides. The list is endless; the impact was obviously profound. From the literature that Renaissance intellectuals plundered they also derived some of their ideas about the garden as an interaction of art and nature, containing both formal and natural parts. They revived the ancient view of nature as a source of inspiration and reenacted the occupations of the ancients at their country estates. Renaissance gardens resound with classical recollections, but these were reassembled in a new way (as were the encyclopedias of plants and the life-size automata) to produce gardens that were different from, if not superior to, those of the ancients.

By following the models of antique gardens and the related developments in scientific cataloguing, machines, and hydraulics, art shaped nature in a variety of ways; but another aspect of nature was acknowledged and expressed in Renaissance gardens as well — the wild, fearful, uncontrollable, and unknowable. This inspired fear, but also awe at the unknown and marvel at its mystery. In his

9. G. B. Aleotti, Iron Workers at a Forge, from *Gli artifitiosi et curiosi moti spiritali di Herrone*, Ferrara, 1589.



Arcadia, composed in the 1480s, Jacopo Sannazaro evoked the wildness of nature, "so beautiful, so marvelous and strange, that at first sight it strikes with unwonted terror the minds of those who enter there," but soon the brave souls "cannot get their fill of gazing upon it."[75] At about the same time Leonardo da Vinci experienced a similar conjunction of hesitation and invitation as he stood stupefied before a cave, feeling the twin emotions of fear and desire, "fear of the dark and threatening cave; desire to see whether there might be any marvelous thing therein."[76] This untamed nature, both frightening and marvelous, was represented allegorically and sometimes actually in the garden, an essential complement to the comprehensible and ordered in nature.

Gardens in Renaissance Italy are witness to the attitude of contemporaries toward nature, much of which was inspired by classical culture. The natural world in all its variety was represented in the garden, including all the marvelous new things that had been only recently discovered. Concern with cataloguing this variety reflected contemporary interest in the natural sciences, by specialists but also by patrons and humanists. In the garden were displayed the latest advances in mechanics, and thus in manipulating the raw materials of nature. The Renaissance view of nature was not monolithic, however, and various aspects were expressed — mythical and monstrous animals and fearful caves, as well as the order that reflected a divine order. Most of all, the garden was a third nature because the interaction was not all in one direction, just as naturalists studied nature and nature provided ever more to be studied. At the same time, scientific investigations, new plants, and developments in machines implicitly challenged some of the underlying notions about the interconnection between humans and nature, and led to the beginnings of a different relationship by the end of the sixteenth century. Art and nature remained the two essential poles of the world view, but with a wider split between them. In seventeenth-century gardens each is very much present, but also more extreme, the art more artificial and the nature wilder than in the gardens of the sixteenth century.