

Introduction to bonsai design

Art & Concept

The Japanese word *Bonsai*, is the combination of the characters *Bon* and *Sai*, which can be translated into “tray or pot planting”. I believe it is important to be mindful of this concept as a constant reminder that “bonsai” is not a specific tree, nor is it specific to one style of tree. Bonsai utilizes our abilities as custodians and gardeners, as well as artists and storytellers. Since my beginnings in the practice of bonsai, I have come to recognize it as the highest form of art I have known. I have a lifelong art background, and my career is also deeply rooted in art. But never have I made a painting that lived and breathed, or required daily attention. And, as has been the case with every other form of art I practice, when the work is done, it is done. This is not true of Bonsai.

Bonsai is then intrinsically more valuable to me in that we work with a living thing. The work is a balance of nurturing and caring for something while managing its growth and struggles. If we neglect the tree, it will die. Gardening, even at a basic level, is helpful in developing the skills required for successful bonsai cultivation, and also is an important part of Japanese culture. Gardening and horticulture are in the roots of Japan as a civilization, evidenced constantly throughout the society via many different practices including *Niwaki* and *Ikebana*.

Niwaki is the art of figurative tree work. Bonsai can be thought of as *Niwaki* in miniature, less *Niwaki* as bonsai in macro. In both cases, the essence of the tree is what we strive to represent. Trees are shaped and manipulated with wire and bamboo over the years very carefully to create impossible forms in the trunks as well as maintained through regular pruning to facilitate the foliar pads that we are familiar with in bonsai. *Ikebana* is the art of flower arrangement, which is a true testament to the principles of balance and harmony.

Although adopted largely by the population as a philosophy more than a religion, Shinto recognizes the concept of *Kami* or spirits, that are believed to inhabit all natural things. This places an emphasis on the symbiotic relationship between man and nature. These natural sculptures are to be honored and revered, and hold a high place in our imaginations.

Bonsai nurtures our concept of mindfulness as well. There is a meditative aspect that comes alongside any work in which the hands get dirty, or work which requires a heightened sense of concentration. We are fortunate in that we are able to practice that concept to scale, as we don't always have time to get to the woods or the mountains. Rather, we bring the woods and the mountains to us. If we work diligently, we have the ability to create something that outlives us all.

Bonsai is the culmination of our ability to garden and sculpt, to tell the story of the tree we are working on. Where did this tree grow? What conditions affected its ability to grow normally? How many seasons of wind or snow were needed to break a branch, or to radically restructure the tree? For those of us who live in Colorado, we are able to take inspiration on an endless myriad of hikes that allow us to see nature as the storyteller. Bonsai also requires us to be visionaries and planners, and through trial and error, we strive to make decisions critical to both the health and design of the tree, even though it may be work stretched across many years.

Ultimately, Bonsai asks us to be comfortable with two concepts initially—patience, and failure. Success only comes at the end of a long line of failure, and is part of our practice of patience. You will kill trees, it is part of the process of learning. We will discuss ways to mitigate these challenges.

Harmony/Balance

Harmony and balance are similar concepts, but not the same. Harmony is a feeling that comes

to the viewer when the conflicting elements in a design resolve. In this case, it is when the design of the tree and pot are in total compositional alignment. We achieve that by allowing the tree to tell us what it wants based on its inherent characteristics. We can utilize the natural movements of the tree combined with manipulation through the process of wiring, bending, and removal to create a tree that expresses a sense of harmony. Bonsai, as all art does, should inspire an emotional response from the viewer.

Balance is achieved using the same elements as harmony, and in this case it can be as literal as it is philosophical. Balance is our concept of the movement of the visual mass of a piece. It is what enables us to see if something is stable or unstable, rhythmic or chaotic, calming or panic inducing. We are not limited by the way a tree arrives to us. We are able to change the angle or the position in the pot in order to obtain the results we desire. Pieces of scrap wood turned into wedges are useful in planning angle changes before the repotting that is needed to complete the process occurs.

The balanced silhouette of both the tree and the pot coalesce to define the overall composition. We strive to create a visually impactful arrangement, so we can look to the basic structures of design. We must also consider the relationship between symmetry and asymmetry, and how we can best use one or the other to create static or dynamic movement. Of the elementary shapes of a circle, a square, and a triangle, the triangle best represents strength and stability. The triangle is also the most dynamic shape, as at least one side of a triangle is diagonal, creating movement (DeGroot). When we build a balanced, triangular composition between our branches and trunk, as well as the pot and potentially even a stand, we are able to achieve a feeling of harmony.

Proportion

There are two great books on bonsai design that are widely available, *Bonsai Techniques* by John Naka, and *Principles of Bonsai Design* by David De Groot. If I had to choose one, it would be De Groot's, as it is more modern, and features much broader and well-defined concepts. The Naka book is excellent but older, and features a large amount of information specific to the California climate, as well as a lot of tree terminology in Japanese.

One thing that the two authors agree on is the overall proportion of bonsai. Proportion is a tool that enables us to take younger material and create the feeling of a much older tree. We do that by taking a tree that is larger than we like, and manipulating it in a way that allows us to utilize the material to its full extent. These are helpful guidelines to follow, but are not rules, as nature constantly breaks them.

The ideal height proportion of a tree is 1:6. This means that a tree with a base of one inch in diameter would be roughly six inches tall. This is very evident in *Chokkan*, or “formal upright style”, which we see often in straight-trunked pines (DeGroot). We use both the height and the width of the tree to create a feeling of a powerful, ancient tree in miniature. Trees in nature don't always grow in a way that makes it easy to adhere to this concept, and so we are always faced with new design challenges.

The Fibonacci sequence is also evident in the trunk and branch structure of bonsai. $1+1=2+1=3+2=5+3=8+5=13$ and so on, which produces an average ratio of 1.618. This is also known as the golden ratio, seen across the natural world from various cacti and flora, to the architectural structures of the tortoise or nautilus' shell. Our eyes will always find this ratio pleasing. We can create branches that are grown using this as a guide. The apex, or crown of the tree, should have the shortest and most compact branch structures, and in a perfect world, the subsequently lower branches would be 1.618 times longer than the branch directly above it. This gives us an optimal branch spread about $\frac{1}{2}$ of the trees overall height (DeGroot).

We can also think of trees as masculine or feminine, based on the trunk and trunkline. A slender trunk promotes a feeling of elegance, gracefulness and femininity, whereas a gnarled angular trunk

suggests age, strength and masculinity (DeGroot).

Bonsai Styles (DeGroot/Naka)

While there are many variations, there are five principle styles of design, based on both branch and root arrangement. Unless otherwise noted, we will focus on single trunks for our design. Many of the variations such as Ascendant, Globe, Broom, Boreal or Flame are often represented in collections, but due to time we will cover the main five.

Formal Upright - *Chokkan*

Very straight single trunk featuring the apex sitting directly over the center of base of the tree. Aside from a slight tilt in the upper portion of the tree towards the viewer, this tree should be very straight.

Informal Upright – *Moyogi*

Single trunk with curves or movement in the trunk, but still resolves with the apex over the base. The top may also tilt towards the established front of the tree

Slanting – *Shakan*

The trunk may be curved or straight, but the apex should fall decidedly to one side of the base or the other. This style is representative of trees heavily influenced by elements such as light or wind. There are varying degrees of slant noted by a prefix of **Sho-** (slight) **Chu-** (medium) **Dai-** (great)

Semi-Cascade – *Han Kengai*

The trunkline is slanted so severely that it is closer to the horizontal position. Typically, a branch or the trunk should dip below the base of the tree, but this is not entirely true of prostrate style, which are still considered semi-cascade. A semi-cascade should have less than 50% of it's visual mass below the horizontal line of the root base.

Cascade – *Kengai*

The difference between *Kengai* and *Han Kengai* is that in this case, the tree should have more than 50% of its visual mass below the horizontal root base line. It may have one or two terminal branches. If two terminal branches are used, the upper should contain roughly 1/3 of the visual mass of the tree, and the lower should contain roughly 2/3.

Branch Structure

Trees are giant circulatory systems and are constantly working at varying degrees based on the seasonal cycles and nutrient uptake. This is very apparent in the natural structure of a tree. We seek to create a refined exaggeration of nature, and much like our height proportions, branches should follow the same progressive ratio. We can use internode growth, cutting and wiring to help set our basic structure on the tree. There is the primary branch, which grows from the trunk, the secondary or auxiliary branches that grow from that, and tertiary and quaternary branches and so on.

According to De Groot, there are some general characteristics in proper branch structure.

1. Observe the three rules

–*Longer branch segments should divide into shorter segments*

–*Thicker should divide into thinner*

–*Direction changes from the previous segments*

2. Branches bifurcate. One element divides into two, and so on. There are times when this will not apply, but we strive for it.

3. Branches have three dimensions. We are not only after length and width, but also depth.

4. Narrow the gap. Branches should divide at narrow angles.

5. Forks, not foliage. No shoots/foiar mass occupying branch crotches, places where branches intersect or emerge from the trunk.

6. No mergers. Branches should not touch, nor should they grow inwards.

Deadwood

Deadwood appears in the form of *Jin*, *Shari/Sharimiki*, and *Uro*. A *Jin* is a bare stripped part of a branch, whereas *Shari* is a bare stripped part of the trunk. *Uro* translates as “to carve out”.

Jin can be created to help solve difficult problems such as numerous low branches, problems with taper, disproportionate branches etc, as well as help us in our narrative of the tree. If we are representing nature in miniature, a close look at many conifers growing in the wild will show years of deadwood, and we are able to replicate that in our coniferous creations. It is our aim to replicate nature in micro, so we try to create *jin* that look natural, as opposed to making a sharp point. We also want to avoid creating *jin* that comes directly towards the viewer when looking at the front of the tree. There are examples of deciduous trees with *jin* as well, but by and large it is reserved for conifers, as deadwood on deciduous trees tends to rot, and therefore leaves no remnant of the branch.

Shari is useful in creating interesting features on the trunk. It can be created by using a sharp knife to remove the bark and the cambium below it, and then painted with Lime Sulphur (a wood preservative) to help create a strong contrast against the foliage. The Japanese *Itoigawa* juniper are prime examples of the use of *Shari* to offer a light contrast to the dark color of the live vein.

Uro is used in situations where the resulting scar from a branch removal may take a longer time (5-10 years in some slow growing deciduous species) to heal than we prefer. We carve out where the branch was cut, and deepen the wound site to create an interesting hollow feature. Lime sulphur mixed with India ink can be used to treat the wound, the ink used so that the color of the lime sulphur isn't so white that it's unrealistic looking.

Container shape/selection/material

When we consider a pot for our trees, we must also consider a few different characteristics of design. How does the pot affect the visual mass of the composition? Too large a pot and the tree feels small. Too shallow a pot, and the tree feels unstable. Based on the movement of the tree, does the pot

enhance or detract from the vision of the artist? Most importantly, the pot should never have a greater visual mass than the tree, or roughly 1/5-1/3 of the visual mass of the overall composition (DeGroot).

Color, shape, size, texture and material are all elements that provide us with a fairly unlimited number of possibilities for any pot. We should select a pot whose form is a reflection of the form of the tree. Symmetrical containers offer a feeling of grounding when used in conjunction with a tree that has a lot of movement. Conversely, rectangles and ovals can offer dynamism to otherwise stable trees (DeGroot).

The texture of the pot should also be a reflection of the tree. Decoration can range from non-existent to wildly over the top creations. Raised or indented panels, kanji, animals or scenes from nature are some of the decorations seen on bonsai pots. Rough, heavily contoured trees may look best in containers with a grainy texture, whereas a more refined tree may be used with a smoother and more refined pot.

The color of the pot is another thing to consider. Traditionally, glazed and colored pots are reserved for deciduous material, while unglazed pots are more suitable for use in conifers. The goal is again to create a balance using the color elements of the tree such as the bark, *jin* or foliage of a pine, or the addition of fruits and leaf changes that define the seasons of a deciduous tree. We achieve that by considering the complementary color to the dominant color of the tree we would like to focus on. Blue is the complement to orange, so a small tree with orange fruit may do best in a glazed blue pot. A Ponderosa Pine has scaly red bark with deep green foliage, so an unglazed pot with a red clay provides a compliment to the green of the needles.

Plant material

While there are a great number of trees available both at nurseries and through wild collection, you will do best when using species that are indigenous to your region. This isn't to say it's impossible to keep zone 8 trees in a zone 3 climate, but it's significantly harder and requires more resources to ensure the success of the tree. For outdoor bonsai, local material and hearty material found at your local garden center are excellent places to begin your selection.

Nursery stock is a great opportunity for the bonsai beginner. You are able to find decent material at a decent price, as opposed to jumping into the expense and uncertainty an already developed bonsai. Characteristics to look for are dynamic movement in the trunk, good basal flare, any indication of exposed large roots or *Nebari*, a good branch structure, and of course, health.

Initial Design

Our initial design is what establishes the overall direction that the tree will take. Some call this setting structure, and what is meant by that is we are able through the use of wire and elbow grease, to manipulate the overall structure of the tree to set the stage for development at later periods in its growth.

To begin our styling it is helpful to clear away any growth we know we don't need such as anything growing downwards, or overgrown branch crotches. This helps us to more easily see the silhouette of the tree. We also clean out excess growth because another factor we must keep in mind is the allowance of light into all parts of the tree. Trees with thick canopies are excellent examples how one part of the tree may thrive, but that may also affect the health and growth habits of branches that become shaded out.

Our first priority is establishing the front of the tree. We should dig away at the base of the tree, at least in the case of nursery stock, and attempt to expose any root structure or significant characteristics that we will focus on in their relation with the overall design. We can change the angle of the tree to assist in creating a more dynamic composition. It is important to note, a tree may go

through many changes in its lifetime, and the front is subject to change. Time and conditions may dictate a reassessment of the tree, and that always opens our options up.

Many practitioners will talk about finding the “first branch”. Once the front is established and the tree is clear of excess growth, starting from the base up we look to the strongest branch to begin our composition. The first branch should be thinner than the trunk, and ideally have a good secondary branch structure. Working from the bottom up, we continue on to establish the second and third branches, and so on. The placement of branches can vary wildly, but ideally the branches should alternate as well as come from interesting points on the trunk. Wildly oversized branches can be useful as *Jin* as well, adding extra weight to the design where it is needed.

As is the case with the front, even with the best care, unforeseeable events can happen to the tree that cause damage to branches and deadwood, which in turn may cause us to reevaluate the design of the tree.

Refinement

As time goes on and growth begins, we are able to identify and cultivate the branches that we choose, to help redefine the structure of the foliage on the tree. We use bifurcation and wire to select and manipulate which branches remain a part of the design of tree, and we can use methods such as pinching to control the overall length of the foliage. As we cut new growth back, the flow of auxin, one of the five major chemicals in the growth of the tree, is reversed back into the tree, creating auxiliary growth through back-budding, our number one priority in the creating the ramification of the pad structure familiar to us. To create pads, we look back to the triangle as a dynamic shape from which to build. We can cut and remove unneeded and downward growth to help define the edge of our pad, and over time and with the proper pruning, we will establish dense, manageable foliage.

With all material, we strive to create the smallest foliage we are able, by containerizing the tree and through a controlled application of nutrient and water, we are able to allow the trees foliar mass to over-facilitate the requirements of the foliar mass. We are able to create a reduction in the overall size of new growth in this manner, as well as through leaf stripping in deciduous species and bud selection or candling on conifers.

The material used will determine the speed of the refinement process. A two-flush pine, or a pine that has two budding cycles in one year, is going to be a lot faster to ramify than a slower growing single-flush which buds only once a season. Careful selection of your material based on the requirements you would like to see met makes the entire process more rewarding.

Conclusion

Bonsai design is a process that is learned over many years. While there are established and proven methods to achieve your design goals, there is always room to grow and try new practices. We are fortunate that the internet and bonsai clubs offer us great forums for discussion with practitioners of all levels. Through diligence, patience, and a lot of trial and error you will be able to develop bonsai you can be proud of.

Sources: This document could not have been possible without heavy contributions from the landmark works below. Areas of heavy influence have been noted in the above document.

Principles of Bonsai Design. David DeGroot. ISBN 10: 0985299819 ISBN 13: 9780985299811

Bonsai Techniques I. John Y. Naka. ISBN-13: 978-0930422318 ISBN-10: 0930422317