

James Basson.

Paper: *How to walk through walls! Generative solution to naturalistic planting design.*



Topic: *Planting Design*

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References:

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Abstract:

Planting design has reached a wall, garden designers are un able to assimilate all the necessary information to allow them to create ever changing and fresh planting designs particularly in **naturalistic** planting schemes. In turn Gardeners are unable to layout the plants corresponding to the highly **complex** scheme’s which have been devised laboriously by garden designers.

There is a solution;

The garden designer formulates the garden plan with the desired volumes paths etc. lays out the planting pattern or movement across the site. And fills this pattern with code... **algorithm’s** which **generate** a series of commands for the gardener to follow without dictating exactly which plant goes where. Leaving room for **happy accidents** and unpredicted plant combinations.

The essay underlines the history behind methods of planting plans, highlights their limitations and shows with a tried and tested garden the **simplicity** of the algorithmic planting scheme, and finishes with a proposition for the next paper on generating plant selections using a generative approach to the infinite choice of plants.



Plants laid out by the gardener following algorithm.

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Walking through walls - Generative solutions to naturalistic planting design.

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Introduction



Throughout history in the world of gardens it has always been man versus nature, gardeners are constantly working to control natural resources to allow him to create an ideal. The balance between organized and spontaneous planting has been in continual flux.



Whether we are trying to tame and organize it as at Versailles



or whether we let it take over and allow it to inhabit its' natural environment.

How can we successfully achieve a balance?



As we have evolved creatively and technologically we are constantly looking back to nature for inspiration, be it in the increasing number of organic shapes used in architecture,



or the generative approaches used to replicate the natural phenomena such as flock patterning.

The sciences continue to uncover the myriad of interrelated processes that make up the natural world. In Ecology plant communities and their symbiotic structures are creating much debate in the world of planting design. How to create sustainable plant communities in the contrived arena of the garden.

The more complex our understanding of nature, the more aware we become of how intricately interconnected the world in which we live is. In the domain of Garden Design, this desire is clearly seen in the increasing demand for naturalistic, complex gardens.



We have come from fearing nature and its uncontrollable power, trying to keep it at bay with walls,



to trying to master it in the formal, high maintenance gardens of the renaissance period, which to this day have created a destructive relationship between man and nature, through industry, agriculture and the depletion of natural resources.

Recent environmental awareness has created an understanding that natural resources now need our protection; diversity is something to be celebrated. Creating 'contemporary' planting schemes means creating complex sustainable communities which are suited to the environmental constraints of the garden. The ever changing nature of these schemes is an underlying mechanism within the plant communities and therefore is part of their beauty.



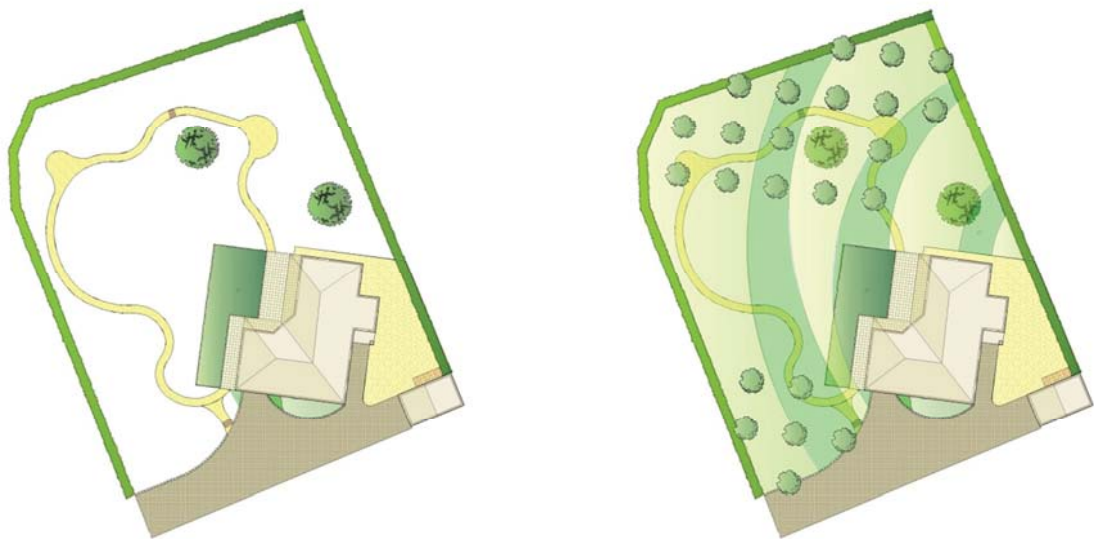
It is at this point, that our understanding of ecology and plant communities reaches a 'wall'. For any one area in a garden there are innumerable options as to which plant can be used where depending on a series of variables – soil type, flowering season, origin, habitat, height, width, colour, frost resistance, speed of growth, competitive nature, shade, sun, longevity, maritime or forest to name but a few. A garden

designer cannot possibly compute all these variables in his head and retain the quantity of plants that could thrive in that particular environment as a result. Whilst databases have made progress in recent years, there is still no one solution which allows us to enter all the relevant data and produce a list of possible plant choices per chosen area. One problem with these databases is that if too many variables are entered, the result is zero options, it becomes too exclusive, it is non-intuitive. Another problem is that the information available is very limited and at times inaccurate, being drawn from the individual experience of the author eg; a plant grown in a Mediterranean climate could reach twice the height of exactly the same plant grown in Scotland, but only cited as being that of when it grows in one of the areas.

There is no satisfactory solution to which plant goes where, other than hard earned experience from a limited palette of plants..

Once we acknowledge that we do not have the capacity to know more than a finite number of plants and their related habits without having a support that as yet does not exist, and we have made our plant selection using the tools available to us, the next issue is how to communicate our decision for implementation?

The garden designer starts the process of plant selection with the site; laid out paths, sitting areas, areas of low vegetation, areas for screening, etc. Coupled with all the environmental constraints of weather, exposition, soil etc.



Once these things are mapped out on the plan the next issue is to decide how the plantings are to be laid out. What rational leads to the pattern of vegetation laid across the garden space, is perhaps a subject for further study in the generative world to create ever changing and evolving plant community patterns?

Once this pattern has been imposed a planting plan is created. The planting plan shows the contractor how and where to place each individual plant.



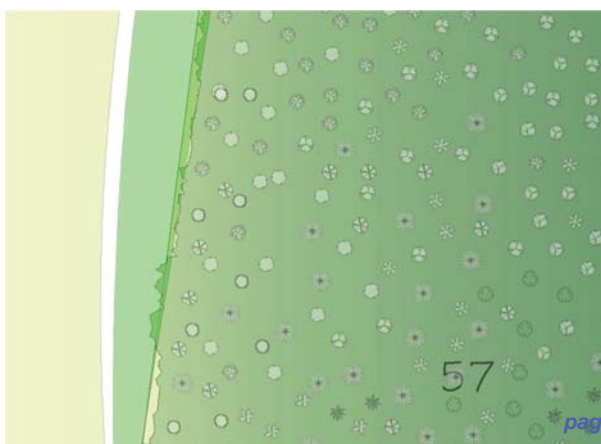
Traditionally designers would produce a planting plan made up of blocks of vegetation; big groups of mono species filled the available space. As you can see such schemes are impractical once the diversity is increased. The Plan soon becomes laden with tabs and markers and the groups are hard to formulate on the ground.



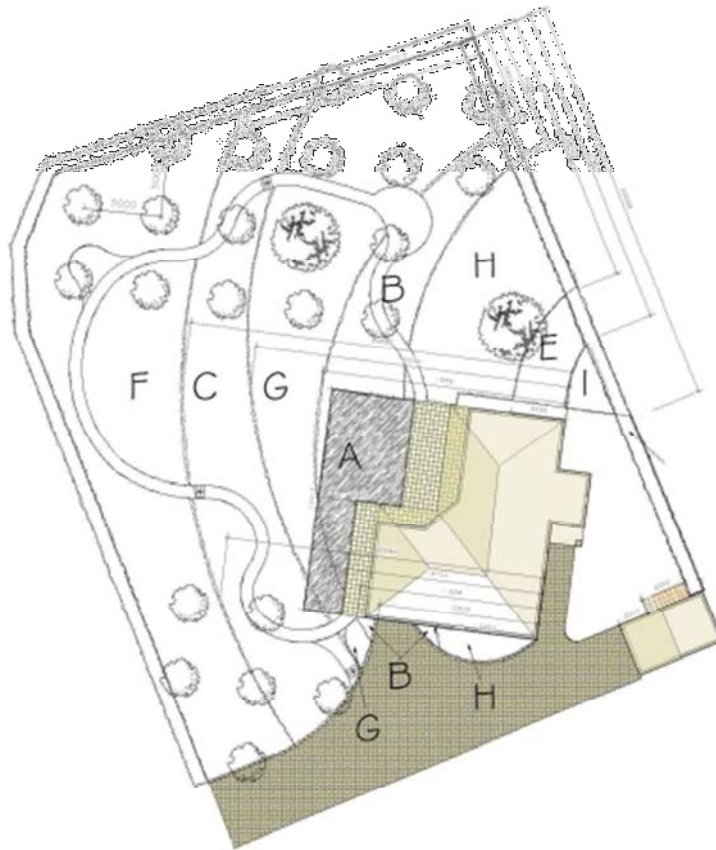
In nature there are very few instances of mono specific communities, they are usually associated with other companion plants which go to make up a more stable ground cover.



The next step was to place plants in a random or ecologically inspired configuration, lettered symbols attached to labels created a matrix of plants, closer resembling communities found in nature. However these plans were hard to read and left little room for interpretation as they required painstaking interpretation.



This scientific approach was replaced with a pictorial solution; this gave the gardener a better feel of the desired pattern of the planting, in this instance dispersed and irregular. However in the field the decision of which plant goes where is difficult to translate.



Garden designers looking back in history became aware of ecological studies for revegetation where the esthetic result was second to the pattern of natural regeneration.

Studies have shown that naturalistic schemes with controlled planting layouts have no more esthetic value than a more flexible formulaic approach, where the gardener decides where the plant goes within certain guidelines.

The garden designer formulates the garden plan with the desired volumes, paths etc. lays out the planting pattern or movement across the site. And fills this pattern with code... **algorithm's** which **generate** a series of commands for the gardener to follow without dictating exactly which plant goes where. Leaving room for **happy accidents** and unpredicted plant combinations

The designer is able to specify a greater variety of plants and by stating the quantity per group of each plant variety (no more than x and no less than y), as well as the planting distance between individual plants it becomes simpler for the gardener to layout the plants.

The value of this approach to plant choice and layout is that it generates unpredictable solutions in each and every case, creating a more diverse range of plant communities that can be applied to different garden situations. The potential for variations within naturalistic planting, provides endless combinations on an ecological and esthetic level. The use of this model on an individual scheme which sets its own environmental restrictions allows the designer to deal with the vast amount of choices available in a simple way, allowing for a maximum amount of creativity within the overwhelming complexity of the natural world.

A composite plan may be valid where in some areas of the garden structural species are laid out in a decisive way and then the understory of perennial, annual and sub shrubs are cast across the site in a formulaic manner using a clearly defined set of rules.



In this way the designer is able to create highly complex garden plant communities which easily translate on to the ground.

Now that there is an available solution to the laying out of plant communities in the garden, more work needs to be done to accumulate, process and produce plant choices, reaching into the mass of information available and creating a mechanism to generate original, sustainable, interrelated plant communities.

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