

Collaboration on the Integration of Sculpture and Architecture in The Eden Project

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Abstract

This paper and talk document my collaboration with Jolyon Brewis of Grimshaw Architects on the design of a new education building for the Eden Project, Cornwall. The roof structure of the building is based on plant geometry in the form of spiral phyllotaxis and incorporates a granite sculpture which will be sited in it's own specially designed chamber at the centre of the building.

This very large sculpture is based on the same growth pattern as the roof and has involved collaboration with professionals from many disciplines including quarrymen, stone masons, engineers and computer experts.

My first involvement with the Eden project was in April 2001 when I was asked to consider the idea of making an 'iconic' sculpture for the site. This was not an easy brief as the biomes themselves are such an iconic and sculptural image, and most of the landscape design had already been finalised.



Figure 1 The biomes at the Eden Project, Cornwall

I wanted to draw attention to the way in which the world of plants has always nourished the human spirit and imagination as well as providing for our physical needs. In particular I wanted to make something which would graphically illustrate how botanical imagery has been incorporated into architecture.

I thought of making a series of free standing architectural columns drawing attention to the idea of columns being symbolic trees with their capitals as stylised foliage. This idea was initially met with enthusiasm by the Eden team, but for various reasons it proved impractical and inappropriate for the existing site.

Subsequently, Jolyon Brewis from the architects Grimshaw, had been commissioned to design a new education building for Eden and Eden's Creative Director, Peter Hampel and CEO, Tim Smit had the idea of establishing a collaboration between me and the architects at the start of the design process. The brief was to contribute ideas that could influence the form and fabric of the new building and also to identify opportunities where artists could enhance the overall scheme, demonstrate the power of human imagination and illustrate the inspiration that can be drawn from natural and organic forms, and in particular plant life.

In March 2003, I was appointed as artist in residence to work with Jolyon on the concept and design of the new building and the appropriate integration of artwork. When Jolyon and I had our first meeting, at my studio, to discuss the building, Jolyon had only received the brief a week or so before.

The brief was that the building should be like a tree. Trees are the largest living things on the planet and are a graphic example of our dependence on plants for oxygen, food, fuel and numerous vital materials from paper to timber, coal to charcoal, fruit to rubber.

Jolyon's initial response to this unusual brief was the broad concept of a lattice roof structure (the canopy) emanating from a central hollow core (the trunk). This lattice produced a pattern of diamond shapes set on a grid of opposing spirals based on concentric circles and radial lines, the diagonals of which created a symmetrical pattern with equal numbers of spirals of the same curvature in both directions.

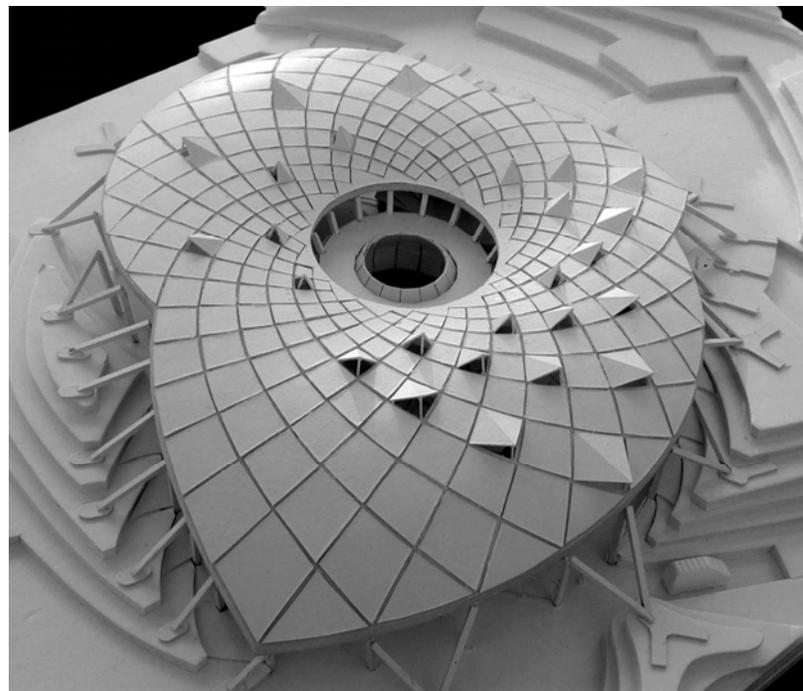


Figure 2 Scale model of The Core, the new education resource centre for The Eden Project

This concept was enthusiastically received by both the client and the Millennium Commission, but there was a problem - the engineers calculated that the structure would require extremely thick (2,000mm) timber members to support the roof at the outer edge.

My own practice has always been informed by observation of living things in general and botanical form in particular. My work has taken me on a journey from relatively literal interpretations of specific forms in nature to an enquiry into the underlying geometric principles which determine the myriad forms that nature produces.



Figure 3 Peter Randall-Page, 'Cone', 1998,
Forest of Dean stone, 61 x 124 x 70 cm

For me the challenge for this building, and any associated artwork, was how to incorporate botanical imagery in a genuinely contemporary and meaningful way. Architecture of almost all periods and all cultures is redolent of plant allusion and imagery. The lotus flower in the far East, the Acanthus in Greece, European medieval stiff leaf carving, the list goes on.

One of the major areas of inquiry in my own work has been the Fibonacci sequence and the golden proportion and the way in which plant growth is determined by these fundamental mathematical principals.

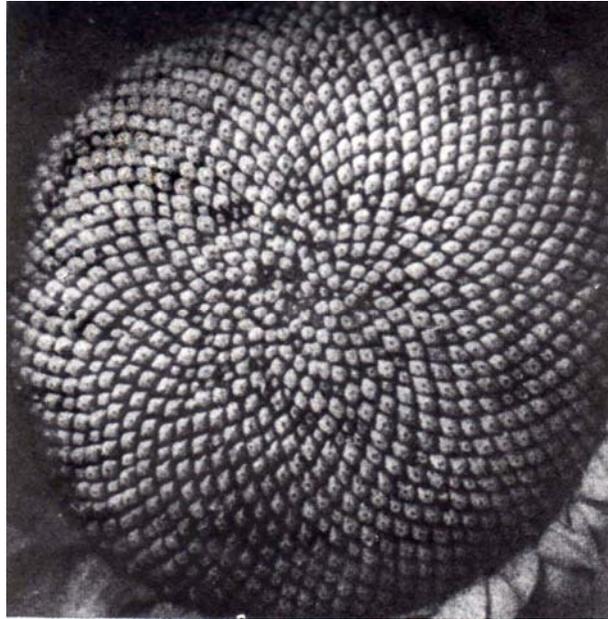


Figure 4 Photograph of a sunflower head

Jolyon's latticed roof structure had an organic feel but was unlike nature in the symmetry of its radial grid structure. We talked about how nature's love of economy results in the kind of patterns one finds in flowers, cones and seed pods and how these patterns can be rationalised mathematically in terms of the golden angle and the Fibonacci sequence. The golden proportion has been understood and used in art and architecture for millennia, but it is only in recent decades that its relevance to phyllotaxis (the study of the geometry of plant growth) has been fully appreciated.

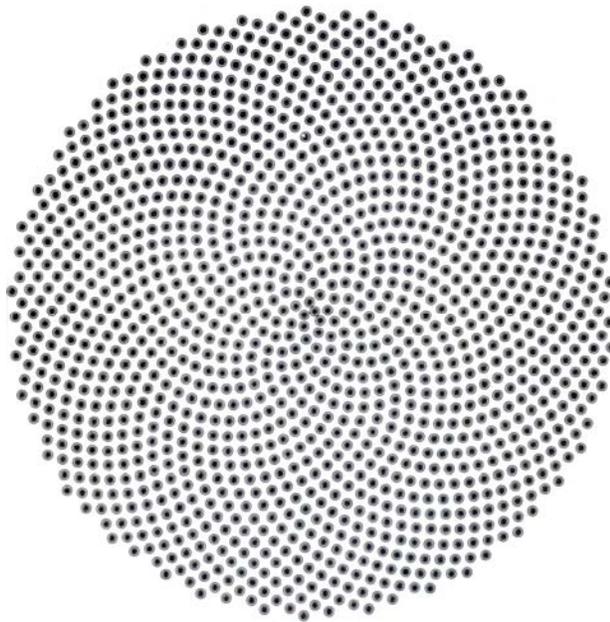


Figure 5 Phyllotaxis pattern

We started to speculate about how the roof structure might be based on the kind of spiral phyllotaxis seen in many plant forms and Jolyon passed this concept onto the engineers (Anthony Hunt Associates). The response from the engineers was very encouraging; based on the spiral phyllotaxis pattern found in plants the structure was far more viable, reducing the depth of timbers at the perimeter of the structure from 2,000 mm to nearer 800 mm. In a way this is not so surprising, the sunflower (for example) wants to pack as many seeds of a similar size into a given circle. Taking the gaps between the seeds as the roof supports was bound to result in an efficient structural geometry.



Figure 6 The building of The Core

The design that Jolyon then produced had a genuine connection with plant growth and was also viable as a roof structure combining botanical imagery with structural efficiency. The roof will be light and elegant and, unlike the geodesic biomes, has a definite centre, in botanical terms the apex from which the primordia emanate.

I had long wanted to make a massive, volumetric sculpture to be contained within a chamber with carefully controlled lighting. I showed Jolyon drawings of these ideas and we began to think of this central space as a chamber to house a massive symbolic seed at the kernel of the building; a distillation of the structural principals of the roof.



Figure 7 The inside roof structure of The Core

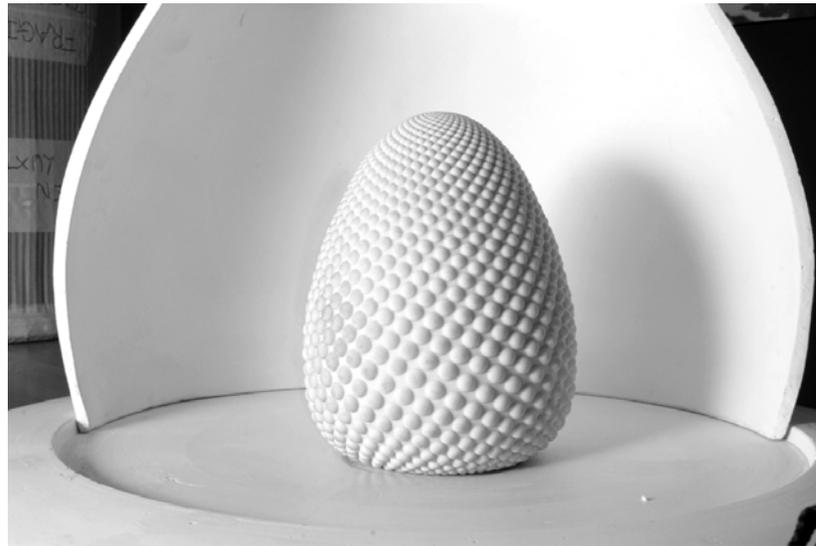


Figure 8 Model of the sculpture and inner chamber for The Core

We thought of this central chamber as a space designed specifically for the sculpture, echoing its shape like a giant seed pod. We also wanted to carefully control the transition that visitors would experience when passing from the main body of the building into this inner chamber. Jolyon designed the central core with a double skin incorporating a circular passageway with low light and dampened sound to maximise the drama of moving from the hustle and bustle of the main exhibits hall to the tranquility of the central space.

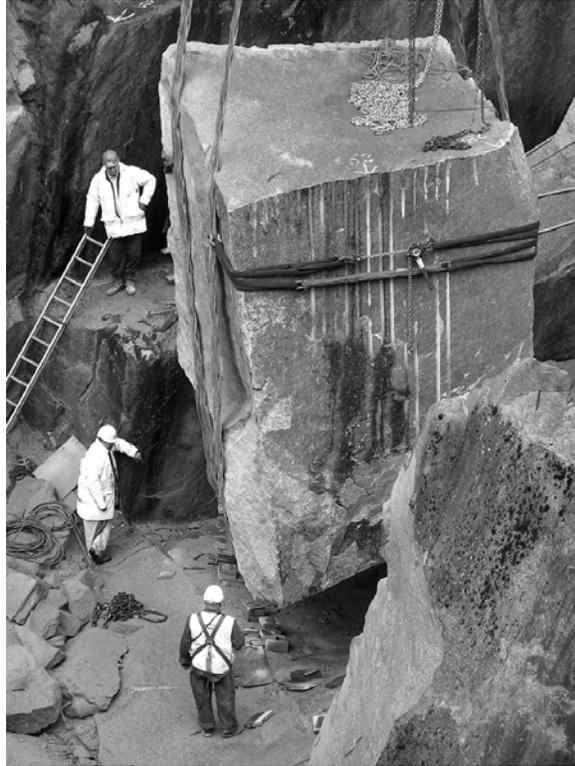


Figure 9 Excavating the stone for the sculpture

The sculpture itself will be carved from a massive piece of granite measuring 4 x 3 x 3m and weighing approximately 80 tonnes. The stone is being specially quarried in Cornwall and its surface will be carved in relief with a pattern based on the same spiral phyllotaxis geometry as the roof structure. This geometry will be reflected in various ways throughout the building, from the arrangement of the windows to the division of the internal spaces.

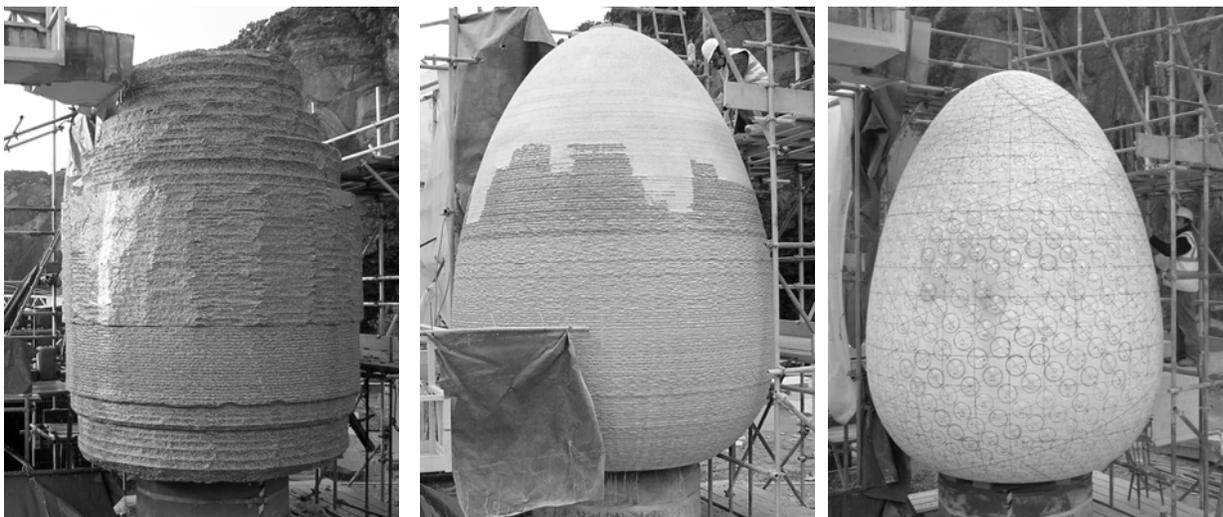


Figure 10 Roughing out the overall form for the sculpture and marking out

Much of the success of this collaboration comes down to the personal chemistry between Jolyon and myself and in particular Jolyon's generosity and openness to my ideas, but also to an awareness by the Eden project of the potential in such a collaboration in the first place. The result is a unique example of collaboration where concept and form, object and structure, architecture and art are inextricably linked.

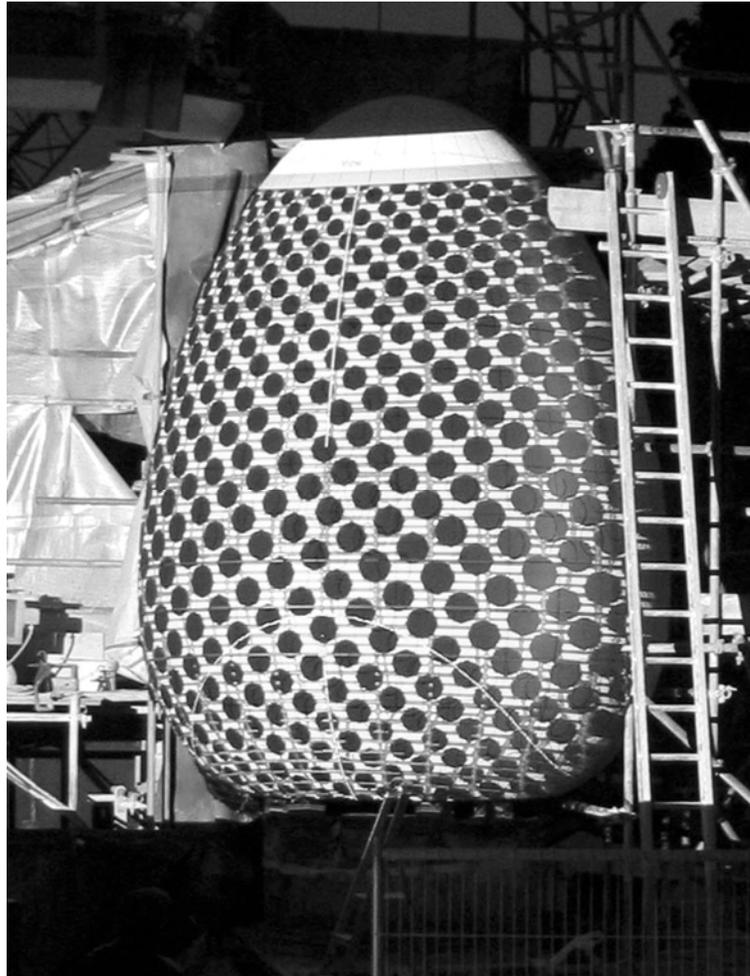


Figure 11 Projecting on the pattern