What is modern architecture cultural studies essay

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Introduction:

What is modern architecture?

Modern architecture is the term used to describe the simplified, unornamented building styles of the late 19th and the 20th centuries. These building styles are also known by other labels like International Style, Neue Sachlichkeit or New Objectivity, and Functionalism. Modern architecture developed as a reaction to the design excesses of the Victorian and the Edwardian period. Proponents of the modern style wanted designs that were more in keeping with the social and political developments of a new age. It also became possible to implement these new design ideas as a result of new technological and engineering developments. Materials like glass, steel, iron and concrete began to be widely used in construction. The architects who designed in the modern style were mainly inspired by machine aesthetics. They determined the form of a building according to its functional requirements and the materials to be used. Simplified forms were preferred and all unnecessary details were banished.

http://www. wisegeek. com/what-is-modern-architecture. htm

What is blobitecture?

Blobitecture, also called " blob architecture" or " blobism", refers to modern buildings with an amorphous, blob-like shape. " Blobitecture" is a term actually coined by New York Times Magazine writer William Safire, who used it to sardonically describe the sudden rise of amoeba-like buildings. Contrary to his intention, architects happily adopted " blobitecture" to describe a new and exciting architectural movement. Blobitecture is a dynamic form of

architecture still widely in use today. Blobitecture is unlike any other architectural form because it completely originates from computer-aided design (CAD). Today, most architects implement blob architecture for glass-and-steel structures. Rarely is it used for private residential homes, because the glass and steel materials makes " blob buildings" fairly transparent. Rather, it is much more frequently used for tourist attractions, such as museums, theatres, and concert halls. It is also increasingly used for scientific buildings, such as geodesic domes used for weather observatories and greenhouses. Lastly, a greater number of commercial buildings are blob structures, such as London's City Hall and the Future Systems architectural firm.

http://shape. ezinemark. com/blobitecture-blob-architecture-4e6acf99956. html

Yet what is blobitecture? It is a term for an architectural school in which organic shapes are the aim, bulging, cellular, amoeba-like buildings its expression. Although the term did not appear in print until 2002, blob architecture had been used as an expression in architectural circles since the middle of the previous decade. Notably it was the New York Times which first brought it to greater attention, as part of William Safire’s On Language column.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

As architects break further free from traditional geometrical shapes, blobitecture is expected to become a more familiar aspect of global cityscapes. CAD is able to produce unlimited forms of blob architecture and

many motivated architects are taking advantage of blobism’s seemingly unlimited boundaries to thrust architecture to its farthest limits.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

Using computer software it is now possible, by manipulating vector and grids, to create forms that are more flexible, amorphous, supple, fluid, incomplete, non-ideal and pliable than ever before. Blobitecture brings us closer to organic shapes. Vitrivius and the Greeks called the body 'the measure of all things' and made it the standard for architecture. With blobitecture, this is becoming a more realistic idea.

http://www. citelighter. com/art-architecture/architecture/knowledgecards/blobitecture

It has been said that despite the emphasis on variation, blob designs all look the same, and that blob designers haven't fully reckoned with the realities of construction. [This work is] a genuine mutation, a natural response to the displacement of bricks and mortar by virtual space. It is not possible, at this point, to know where this response might lead. But [Greg] Lynn is encouraging his students to emulate nature: to throw a bunch of combinations out there with the expectation that some of them will survive and mutate further in an environment that is also rapidly evolving.

http://www. citelighter. com/art-architecture/architecture/knowledgecards/blobitecture

Origins of the term ‘ blob architecture’

When architecture critic Reed Kroloff saw earl examples of the organically globular structures […] he recognized a new genre aborning and christened it " blobitecture." http://www. citelighter. com/art-architecture/architecture/knowledgecards/blobitectureThe term 'blob architecture' was coined by architect Greg Lynn in 1995 in his experiments in digital design with metaball graphical software. Soon a range of architects and furniture designers began to experiment with this " blobby" software to create new and unusual forms. Despite its seeming organicism, blob architecture is unthinkable without this and other similar computer-aided design programs.

http://en. wikipedia. org/wiki/Blobitecture

Blobitecture arose during the 1990s when CAD systems were first being developed for architects and interior designers.

http://shape. ezinemark. com/blobitecture-blob-architecture-4e6acf99956. html

Architects derive the forms by manipulating the algorithms of the computer modeling platform. Some other computer aided design functions involved in developing this are the nonuniform rational B-spline or NURB, freeform surfaces, and the digitizing of sculpted forms by means akin to computed tomography

http://en. wikipedia. org/wiki/Blobitecture

Binary Large Object (BLOB)

Lynn used the term as a substitute for biomorphic form, deriving it from a kind of acronym from a technical description of a computer-formed shape - a binary large object. He envisioned blob architects discovering a new form of splendor, sophistication and elegance in the voluptuous, cadenced and undulating shape of differential calculus.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

Greg lynn

We have architect Greg Lynn to thank for the original term – he invented it in 1995 to give definition to his experiments in digital design. He used metaball software, the technique for which had been invented by Jim Blinn (a NASA computer scientist) in the first years of the 1980s. This blobby modelling (real term) enabled the creation of organic-looking n-dimensional objects, where n is the number of dimensions (usually 2 or 3) being measured.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

The architect Greg Lynn coined the term blob architecture in 1995 with no derision in mind. He was drawing on a computer, clicking out a random cloud of points that assumed an amorphous shape, loose and formless as an amoeba, which digital designers sometimes call a ''biomorphic form.'' Lynn tells me the term ''blob'' comes from a sort of acronym for a technical description of a computer-formed shape -- a ''binary large object.''Although

blob architecture ''lacks the elegance, rigor and beauty that comes from modules, proportions and symmetry,'' Lynn says, ''in due time, the blob architects will discover a new form of beauty and elegance in the voluptuous, rhythmic and undulating forms of the differential calculus.''

http://www. nytimes. com/2002/12/01/magazine/01ONLANGUAGE. html? pagewanted= all

three architects whose computer-driven approach was, at the time, associated with Columbia’s paperless studios: Greg Lynn, Michael McInturf, and Douglas Garofalo. They had designed a strangely shaped church for a Korean con gregation in Queens, and they insisted that they didn’t start out with a particular aesthetic in mind but rather fed data about the building’s requirements into a computer, using software that responded to the data by drawing rounded shapes. At the time, this approach was characterized as " blob" architecture.

http://www. citelighter. com/art-architecture/architecture/knowledgecards/blobitecture

Greg Lynn is an architect, philosopher, and science-fiction author. Greg Lynn was born in 1964 in Ohio. Greg Lynn has been a professor of conceptual architecture at the European Graduate School EGS where he conducted an Intensive Summer Workshop. He teaches the course Architecture and Philosophy: An Exploration of the Future. Greg Lynn's architectural work, which is highly informed by his reading of philosophy, is prominent among contemporary architecture for its biomorphic style. TIME magazine has named Greg Lynn one of the top 100 innovators of the 21st century. He lives

and works in Venice, California. Greg Lynn is one of the most innovative architects working today. Drawing much of his inspiration from mathematics, philosophy, and postmodern theory and in particular the work of Gilles Deleuze, Luce Irigaray, Sanford Kwinter, Ilya Prigogine and others. Greg Lynn develops his architectural projects utilizing the concepts of high theory. Computers are a principal element in Greg Lynn's design process, which he believes can be used to integrate calculus into the design of new architectural forms. He has developed this idea in his theoretical book Animate Form (1999). Greg Lynn earned combined BA degrees in philosophy and architecture from Miami University of Ohio, and he received his Master of Architecture degree from Princeton University. Greg Lynn says the following about the connection between his education and his current work: In the end it's geometry. I've always studied architecture —ever since I was a little kid. I had the full treatment, because my mother was the equivalent of a stage mother. I could draw perspective before I was in junior high school. Visualizing geometry and thinking abstractly was something that came easily. When I went to college I got out of architecture for a while, and majored in philosophy. Then I realized that all the philosophy I was reading was really about form. Greg Lynn has taught at several universities around the world: The University of Applied Arts, Vienna (tenured); ETH Zurich; University of California, Los Angeles, Department of Architecture and Urban Design; Yale School of Architecture; and Columbia Graduate School of Architecture Planning and Preservation. He has also started his own design firm, Greg Lynn FORM, which is known for several prominent projects, including the New York Presbyterian Church in Queens. Greg Lynn's innovations in form and structure, which flirt with the possibilities opened by

digital technology and envisage ideas of science-fiction, have made stunning breakthroughs in their increased ability to sustain the building's weight. The structures Greg Lynn has created; both by himself and with the other architects in his design firm; push towards the unknown in their irregular geometry and biomorphic shapes. He is very candid about his refusal of any nostalgia for a past which is inaccessible. At the same time, his work is unusually daring, and seems as though it would not be out of place in a science-fiction film. One of the most extraordinary and futuristic of Greg Lynn's projects is the proposed design for the Welsh National Opera House in Cardiff Bay. The structure was conceived as a highly elaborate housing structure of numerous branching public spaces. The design, which draws its inspiration from the graving docks surrounding the opera house, is highly versatile in its use of wall fins and branching volumes, creating a space which is not static, but continuously adjusting to the flows of music and audience in its acoustic and spatial attunement. He is one of the pioneers of the digital design, fabrication and design processes. Greg Lynn has created what is called Blob Architecture, which as he says, " The term is used to describe binary large object modelling. Basically you take a whole bunch of polygons and you smooth them all together. It allows you to build with the surface in mind and brings architecture into dialogue with other fields like fine art and aerospace. Greg Lynn writes the following about his Blob work, When I first used the term it was completely technical. The term Blob modelling was a module in Wavefront software at the time, and it was an acronym for Binary Large Object - spheres that could be collected to form larger composite forms. At the level of geometry and mathematics, I was excited by the tool as it was great for making large-scale single surfaces out

of many small components as well as adding detailed elements to larger areas. At a conceptual and technical level, I loved it and I do not expect this kind of nerdy involvement with the details of my profession to be shared or understood. One example of Blob Architecture is his piece, Unique ‘ Blobwall’, (2007). The Blobwall is made of low-density, recyclable and impact-resistant polymer with measurements of 217. 2 x 373. 4 x 121. 9 cm. (85 1/2 x 147 x 48 in.), the polymer is produced by Panelite, USA. The blob bricks he makes have been incorporated into multiple art exhibitions that explore the concept of building with flexible materials. Blob Architecture brings his field into the realms of fine art and aerospace, he is innovating a way of building that keeps surface in the forefront. These are another example of the innovative and visionary works of Greg Lynn. As a conceptual architect his work barely touches the contemporary in its reach to envision the future. An interesting part of Greg Lynn’s creative process lies in his use of computers. While normal architects first realize their designs with paper and pencil and then bring in the aid of computer drafting software, Greg’s amorphous designs draw on computers from the start. He relies on technology and software from the film industry and other creative fields to realize and design his non-traditional forms of building. Instead of thinking of design as a way of connecting lines he re-envisions curves as the designing space within a flexible medium, as he says, " we've shifted to thinking of space as the sheltered enclosures of a flexible handkerchief."

http://www. egs. edu/faculty/greg-lynn/biography/

Meatball graphical software

Metaballs are, in computer graphics, organic-looking n-dimensional objects. The technique for rendering metaballs was invented by Jim Blinn in the early 1980s. Each metaball is defined as a function in n-dimensions (i. e. for three dimensions, f(x, y, z); three-dimensional metaballs tend to be most common, with two-dimensional implementations popular as well). A thresholding value is also chosen, to define a solid volume. Then, sum_{i= 0}^n mbox{metaball}_i(x, y, z) leq mbox{threshold}represents whether the volume enclosed by the surface defined by nmetaballs is filled at (x, y, z)or not. A typical function chosen for metaballs is f(x, y, z) = 1 / ((x-x_0)^2 + (y-y_0)^2 + (z-z_0)^2), where (x_0, y_0, z_0)is the center of the metaball. However, due to the divide, it is computationally expensive. For this reason, approximate polynomial functions are typically used.[citation needed]When seeking a more efficient falloff function, several qualities are desired: Finite support. A function with finite support goes to zero at a maximum radius. When evaluating the metaball field, any points beyond their maximum radius from the sample point can be ignored. A hierarchical culling system can thus ensure only the closest metaballs will need to be evaluated regardless of the total number in the field. Smoothness. Because the isosurface is the result of adding the fields together, its smoothness is dependent on the smoothness of the falloff curves. The simplest falloff curve that satisfies these criteria is: f(r) = (1 - r^2)^2, where r is the distance to the point. This formulation avoids expensive square root calls. More complicated models use a Gaussian potential constrained to a finite radius or a mixture of polynomials to achieve smoothness. The Soft Object model by the Wyvill brothers provides higher

degree of smoothness and still avoids square roots. A simple generalization of metaballs is to apply the falloff curve to distance-from-lines or distance-from-surfaces. There are a number of ways to render the metaballs to the screen. In the case of three dimensional metaballs, the two most common are brute force raycasting and the marching cubes algorithm. 2D metaballs were a very common demo effect in the 1990s. The effect is also available as an XScreensaver module. http://upload. wikimedia. org/wikipedia/commons/6/6d/Metaball_contact_sheet. pngThe interaction between two differently coloured 3D positive metaballs, created in Bryce. Note that the two smaller metaballs combine to create one larger object. http://en. wikipedia. org/wiki/Metaball

Computer Aided Design CAD

In software architect jobs, architects use CAD to manipulate buildings' outlines to virtually any shape. While they do this, the software automatically calculates mathematical equations that instill structural soundness into the design. Before CAD's development, architects adhered to mainstream geographical shapes since they were confident of these shapes' structural stability. Now, thanks to CAD software, a building's shape has boundless possibilities. Architects today rely on numerous CAD software programs to construct blob architecture. Contrary to its appearance, many mathematical calculations go into 'blobitecture' designs. Most CAD programs, such as AutoCAD, permit the user to create a basic three-dimensional " sketch" and manipulate those lines in numerous directions. Blob architecture arises when the user makes those lines " wavy" and irregular, and " inflates" the building design. In the later stages of the structure's design, architects can use CAD

to specify the building materials and interior components of the project. As a measure of blobitecture's popularity, architectural students may now take college courses in blobitecture. There are also online courses featuring blobitectural study. Many architects who concentrate on urban-planning architecture decide to learn about blobitecture, since blobitecture is mainly prevalent in metropolitan areas. Furthermore, many CAD courses, offered both online and on-site at educational institutions, permit architects to gain hands-on practice with blobitectural design. As more architects break away from established geometrical forms, blobism will likely become part of more international cityscapes. CAD will generate infinite forms of blobitecture in both exterior and interior design. Many ambitious architects are exploiting blobism to push architecture to its outermost limits. In addition, many entry level architect jobs demand CAD experience; so many architectural students are choosing to use blobitecture to gain fluency in CAD.

http://architecturenotebook.com/architecture-exhibitions/blobitecture-blob-architecture/

Blobitecture is distinct from other architectural forms as it wholly created from computer-aided design (CAD). Architects employ CAD to control buildings' outlines to practically any form. To enable them to do this, the software automatically computes mathematical equations that implant structural accuracy and dependability into the design. Before CAD's maturity as a tool, architects remained in thrall to a conventional geographical character as they were certain that these shapes had structural stability. Now, thanks to CAD software, the shape of a building has unlimited potential.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

Put simply, without computer-aided design, blobitecture would be impossible – as would the new and unusual forms that architects and furniture designers were experimenting with shortly after Lynn. The manipulations of the algorithms needed to derive the forms are impossible to do on paper.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html

Built examples in the UK

Selfridges, Birmingham UK

Renowned for its architectural excellence. The astonishing new £40m Selfridges building in Birmingham is the shape of things to come. Birmingham's 26-acre Bull Ring opens this week. It is, says its developer, the Birmingham Alliance, " Europe's largest retail-led regeneration project, representing an investment of over £1bn, providing 110, 000 sq m of new retail accommodation over three trading levels". The Bull Ring is home to 146 shops, 57 of them new to the city.

http://www. guardian. co. uk/artanddesign/2003/sep/01/architecture. shopping

The Selfridges Building is a landmark building in Birmingham, England. The building is part of the Bullring Shopping Centre and houses Selfridges Department Store. The building was completed in 2003 at a cost of £60 million[1] and designed by architecture firm Future Systems. It has a steel framework with sprayed concrete facade.[2] Since its construction the

building has become an iconic architectural landmark and seen as a major contribution to the regeneration of Birmingham.

http://en. wikipedia. org/wiki/Selfridges_Building,_Birmingham

Selfridges department store in Birmingham is an example of this audacious design style with an exterior of 15, 000 spun aluminium discs, all painted blue. £40m shop

http://www. guardian. co. uk/sustainable-business/guardian-live-discussion-biomimicry-sustainable-green-design

This Birmingham-based department store is a truly remarkable example of a notion called blobitecture. Its form escapes the usual structure of edges and walls into a curved and rounded sculpture, one could even call organic. Not only its unique shape and aluminium facade discs, but also the location right on the edge of city center between the rail and bus stations, make it instantly noticeable in Birmingham's skyline.

http://www. galinsky. com/buildings/selfridges/index. html

The Selfridges Department Store in Birmingham completed in 2003 quickly became a heavily discussed landmark. This is what Future Systems say about he building on their website: " Our brief was not only to design a state of the art department store but also to create an architectural landmark for Birmingham so that the building itself would become a genuine catalyst for urban regeneration. We have re-interpreted the notion of a department store, not just in its form and appearance but also in the social function such a building now plays in our society. Its relationship to the church is significant, representing the religious and commercial lives of the city that

have evolved side by side over hundreds of years. http://architectuul.com/architecture/selfridges-birmingham

Future Systems, Jan Kaplicky & Amanda Levete

Amanda Levete (born 17 November 1955, Bridgend) is a British architect, principal of Amanda Levete Architects (known as AL_A). Formerly married to Jan Kaplický with whom she had a son, for 20 years they were co-partners at Future Systems.

http://en. wikipedia. org/wiki/Amanda_Levete

Future Systems was a London-based architectural and design practice, formerly headed by Directors Jan Kaplický and Amanda Levete. The work of Future Systems can be classified within the British high-tech architects as either bionic architecture or amorphous, organic shapes sometimes referred to as " blobitecture". Future Systems proposals adapted construction methods from other professions, including (most commonly) the curved monocoque shell structures found in aircraft design, car design and boat building. In the 1990s the company moved from theoretical projects to fee-paying work with projects such as the " spacecraft-like"[2] Media Centre at Lord's Cricket Ground in London (completed 1999), and the Selfridges Building (completed 2003). For Lord's, Kaplicky received the Stirling Prize. The Selfridges department store is a prime example of the early 21st century movement referred to as " blobitecture", and has been compared to Peter Cook's Kunsthaus in Graz, Austria. After Future Systems won the Stirling Prize, the firm received larger commissions including the Maserati Museum in Modena, Italy (2009)[3] and the unbuilt new Czech National Library. In 2008 Kaplický and Levete split the firm. Kaplický took the firm name and

some staff to the Czech republic, and Levete would take a proposed new headquarters for News Corporation in east London and a commission for a hotel and retail complex in Bangkok, Thailand, along with most of the staff — between 35 and 45 people.

http://en. wikipedia. org/wiki/Future_Systems

Selfridges Birmingham has been designed by Future Systems studio, which has recently split into two separate practices. It received numerous awards for innovative design including the RIBA Award for Architecture in 2004 and has been featured as one of 100 stores to visit in the world by Retail Week magazine every year since its opening. An unfortunate sudden death of Jan Kaplicky, one of two partners involved in designing the building, surprised the architectural body in January 2009

http://www. galinsky. com/buildings/selfridges/index. html

Location

The building is situated just by St Martin's church in Bullring shopping area, which creates this kind of awkward relationship between the historic sight of faith and more current but also glorious temple to consumption. Inside you can find an impressive criss-cross of white escalators around the main atrium, surrounded by approx 25, 000 m2 of retail store area. What is more, on the top floor, the building is joined with a parking lot on the opposite side of the street through a walking tunnel, which makes it look as if it has a tongue sticking out of it.

http://www. galinsky. com/buildings/selfridges/index. html

Not only its unique shape and aluminium façade discs, but also the location right on the edge of the city centre between the rail and bus stations, makes it instantly noticeable in Birmingham's skyline. The building is situated just by St. Martin's Church in the Bullring shopping area, which creates a kind of awkward relationship between the historic sight of faith and more current but also glorious temple of consumption.

http://www. mimoa. eu/projects/United%20Kingdom/Birmingham/Selfridges%20Birmingham

Structure

selfridges birmingham is like no other building. its three-dimensionally curvaceous form hugs the dramatic incline of the newly redeveloped bull ring site as it moves like a shimmering silver wave and drops down to st martin’s square below. glimpsed from the train entering birmingham new street station from the south, it promises mystery and excitement in a city undergoing a 21st century renaissance. the fluidity of the building’s form, recalling the fall of fabric or the soft lines of a body, strikes a contrast with conventional, angular buildings nearby and, in particular, provides a beautifully ethereal backdrop for the gothic architecture of st martin’s church. most structures with curved facades undulate only in two dimensions – in plan they may be rounded in shape, but in elevation they are not. the selfridges building curves three-dimensionally. thus its design makes no distinction between ‘ walls’ or ‘ roof’, and there are no abrupt angles to break the organic, flowing lines. rising from the ground, the facade gently

billows outwards before being drawn in at a kind of waistline. it then curves out again and over, in one continuous movement. the exterior is enveloped in a skin made up of thousands of aluminium discs, creating a fine, lustrous grain like the scales of a snake or the sequins on a paco rabanne dress. this surface remains constant across the whole building, reinforcing the unity of the structure and giving it the quality of a vast, sensuous architectural sculpture. although this is a large building it gives an impression of weightlessness, and can appear almost animate and breathing. in sunlight it shimmers, reflecting minute changes in weather conditions and taking on the colours, light and shapes of people and things passing by. at the top of the building is a soaring free-form opening, glazed but revealing only minimum support, so that the roof is experienced from beneath as a sheer membrane. it pours light down into a great canted atrium, allowing a clear view of the sky and giving a real sense of changing weather conditions outside. the flood of natural light articulates the store’s dramatic inner landscape with highlights, shadows and reflections. large, sinuously shaped openings carved from the form at the sides provide shop windows and views out. these openings are frameless but are surrounded with an edge of yellow frits, gently defining their shape.

http://www. danda. be/reviews/selfridges_birmingham_future_systems/

Each floor has been shaped by a different team of designers - Cibic and Partners, Stanton Williams, Eldridge Smerin and Future Systems

http://www. guardian. co. uk/artanddesign/2003/sep/01/architecture. shopping

The fluidity of shape recalls the fall of fabric or the soft lines of a body, rises from the ground and gently billows outwards before being drawn in at a kind of waistline. It then curves out again and over to form the roof, in one continuous movement. The skin is made up of thousands of aluminium discs, creating a fine, lustrous grain like the scales of a snake or the sequins of a Paco Rabanne dress. In sunlight it shimmers, reflecting minute changes in weather conditions and taking on the colours, light and shapes of people and things passing by - an animate and breathing form. The interior is planned around a dramatic roof lit atrium criss-crossed by a white cat’s cradle of sculpted escalators and a smaller but equally powerful atrium.

http://architectuul. com/architecture/selfridges-birmingham

Inside, you can find an impressive criss-cross of white escalators around the main atrium, surrounded by approximately 25. 000 m2 of retail store area. What is more, on the top floor, the building is joined with a parking lot on the opposite side of the street through a walking tunnel, which makes it look like it has a tongue sticking out of it.

http://www. mimoa. eu/projects/United%20Kingdom/Birmingham/Selfridges%20Birmingham

The Sage, Gateshead UK

the northeastern city of Gateshead has the Sage Gateshead building, which was designed by the Foster and Partners architectural firm. This building is a performing-arts center and musical institution. This structure has a

caterpillar-like shape, made up of multiple spheres that contract and dilate as the building progresses. Its materials include glass and stainless steel, allowing it to shimmer from capturing all angles of sunlight. Its free-flowing shape may be said to reflect this institution's philosophy that all musical genres are equal.

http://shape. ezinemark. com/blobitecture-blob-architecture-4e6acf99956. html

Foster and Partners £70 million performing arts centre, The Sage Gateshead opened officially to the public on 17 December 2004. With its dramatic shell-like form, the glistening stainless steel clad building perches high above the River Tyne enjoying spectacular views towards Newcastle. It fulfils three demanding criteria: to create an international centre for musical performance and education, with acoustically excellent auditoria and unparalleled teaching facilities; a major public building that is fully inclusive and accessible for all; and a centrepiece for the regenerated Gateshead Quays area.

http://www. fosterandpartners. com/News/168/Default. aspx

The Sage Gateshead took ten years of detailed planning and was designed after extensive consultation with musicians, audiences and music presenters and promoters.

http://thesagegateshead. org/about-us/landmark-building/

Developed by Foster and Partners, The Sage Gateshead is a local landmark and internationally renowned cultural centre that has played a key part in Tyneside's regeneration. For years, the South Bank of the River Tyne lay

derelict until in the late 1990s Gateshead Council took the visionary decision to develop this run down area and create a cultural zone along the Gateshead Quayside. The first project launched as part of this initiative was an RIBA competition for the design of a new prestigious arts venue in the derelict Baltic Flour Mill. The second, in 1997, was for a new world-class concert hall and music centre. Over 100 architects registered their interest and 12 – a mixture of local, national and international talent – were invited to prepare concept designs. A shortlist of six were then interviewed with Foster and Partners unanimously selected as the winner. The £70m building, now named The Sage Gateshead, is a graceful and curvy design, made of steel, glass and aluminium. It is home to the Northern Sinfonia. It houses two concert halls, a rehearsal hall, bars, restaurants and education facilities. The new building opened to the public on 17 December 2004 and is expected to attract over 1 million visitors with 420 performances programmed each year.

http://www. architecture. com/UseAnArchitect/FindAnArchitect/Competitions/CaseStudiesNew/Cultureandleisure/Arts/Sage/Sage. aspx

Cllr Mick Henry, Leader of Gateshead Council said: " Thecompletion of this spectacular building is a major milestonein the area’s regeneration. The real beneficiaries of all thisinvestment are the local communities as it brings far reachingcultural, economic and education benefits to Tyneside andthe region as a whole."

http://www. architecture. com/Files/RIBAProfessionalServices/CompetitionsOffice/caseStudies/2012/TheSageGateshead. pdf

Foster and Partners

norman foster was born in manchester, england in 1935. his father was a shop manager in a poor areaof manchester, later a sucurity guard and amanual worker in a factory. his parents sent himto a private school and grammar school. there was a strong work ethic and pressure toleave school early and be a wage earner andfoster worked for two years in the city treasurer'soffice, studied commercial law, before leavingfor national service in the royal air force. at this time he was developing a growing interestin architecture. when he came out of the air forcehe worked in a bakery, sold furniture, worked in afactory... after graduating from manchesteruniversity school of architecture and city planningin 1961, which he entered at age 21, he won afellowship to yale university wherehe gained amasters degree in architecture and where he gotto know richard rogers. they became very closefriends and in 1963 he worked with him and suerogers, gorgie wolton and his wife, wendy foster, as a member of 'team 4' until foster associates wasfound in 1967 (now known as foster and partners). since its inception the practice has receivedmore than 190 awards and citations for excellenceand has won over 50 national and internationalcompetitions. 1968 - 1983 cooperation with buckminster fulleron a number of projects. foster was awarded the RIBA royal gold medal in1983, and in 1990 the RIBA trustees medal wasmade for the willis faber dumas building. he was knighted in 1990, and recieved the goldmedal of the AIA in 1994. he was appointed officer of the order of the artsand letters by the ministry of culture in francein 1994. it

was announced in the queen's birthday honourslist on 12 June 1999 that sir norman foster hasbeen honoured with a life peerage, taking the titlelord foster of thames bank. and in the same year he was awarded theprestigious 21st pritzker architecture prize laureate– considered the nobel prize of architecture. his remarkable buildings and urban projectshave transformed cityscapes, renewed transportationsystems and restored city centres all over the world. many of these aesthetically and technologicallygroundbreaking projects are based on ecology -conscious concepts, setting new standards for theinteraction of buildings with their environment. among his recent projects are some of the mostremarkable architectural projects of the last years, including the reconstruction of the reichstag in berlin, the design of the great court at the british museumin london, the millennium bridge (the first new thamescrossing for more than 100 years), and the newhong kong international airport - the world’s largestairport terminal. norman foster has lectured throughout the world and hastaught architecture in the united kingdom and the usa. he has recently accepted a post-graduate visiting professorshipat university college, bartlett school in london.

http://www. designboom. com/portrait/foster/bio. html

Foster + Partners is an architectural firm based in London. The practice is led by its founder and Chairman, Norman Foster, and has constructed many high-profile glass-and-steel buildings. Established by Norman Foster as Foster Associates in 1967 shortly after leaving Team 4, the firm was renamed in the 1990s to more accurately reflect the influence of the other lead architects.

http://en. wikipedia. org/wiki/Foster_and_Partners

Appointed in 1997 after an international selection process, Foster and Partners lead a team of consultants including Arup Acoustics, Buro Happold, Davis Langdon, Mott MacDonald and Theatre Projects Consultants.

http://www. fosterandpartners. com/News/168/Default. aspx

The building was the first performing arts structure designed by Norman Foster, who is famed for his designs for 30 St Mary Axe (The Gherkin), the new Wembley Stadium, and the Millennium Bridge, all in London.

http://www. engagingplaces. org. uk/teaching %20resources/art72217

Landmark building

The Sage Gateshead has already become a new landmark on Tyneside, forming the heart of an exciting project to regenerate the area’s river frontage. The site is adjacent to the Stirling Prize-winning Gateshead Millennium Bridge and the Tyne Bridge, with its great arch echoed in the shell-like form of The Sage Gateshead’s roof. The Sage Gateshead includes two auditoria with outstanding acoustics, a rehearsal space and a 25-room Music Education Centre – each conceived as a separate enclosure. The windswept nature of the site led Fosters to create a welcoming covered concourse along the waterfront to link the various spaces. As a result the entire complex is sheltered beneath a broad, enveloping stainless steel roof that is ‘ shrink-wrapped’ around the buildings beneath. This extends over the Concourse, which acts as a foyer for the auditoria and hospitality areas for performers, audiences and students alike, offering unique views out across the Tyne.

http://thesagegateshead. org/about-us/landmark-building/

The building was constructed with a special type of concrete that contains extra air bubbles to help with sound-proofing and acoustics. The roof of the Sage Gateshead contains 3, 500m2 of glass (equal to 8. 3 basketball courts) and 3, 043 stainless steel panels (equal to 2. 2 football pitches). The building is over 40 metres tall at its highest point, which is twice as high as the Angel of the North sculpture by Antony Gormley.

Building highlights

The beautiful glass balustrade that runs the length of the concourse level is an impressive feat of artistic imagination. Designed by Kate Maestri, it is 200 metres long and weighs 8224 kilograms – that’s the same length as 611 violins, 15 grand pianos, or two Northern Sinfonia orchestras!

http://www. engagingplaces. org. uk/teaching %20resources/art72217

The Sage Gateshead

Gateshead, UK, 1997-2004

With its informal atmosphere and unrivalled views out across the Tyne, The Sage Gateshead is one of the city's great social spaces as well as a regional music centre of international standing. The entire complex is sheltered beneath a broad, enveloping roof that is ‘ shrink-wrapped’ around the buildings beneath and extends over a public concourse. http://www. fosterandpartners. com/Projects/0984/Default. aspx

Building and site description

A single, flowing roof unifies three separate auditoria, back of house facilities, a Music Education Centre, entertainment rooms, offices for The Sage Gateshead and a public concourse. The roof soars above the concert halls, its shape inspired - in part - by the iconic arches of the Tyne Bridge. Under this dramatic form, the independent volumes of the three halls, each with its own particular shape, can be easily distinguished. Accessibility for all has been key to our design approach. For example the performance spaces of all three auditoria and the loading dock are on the same level allowing ease of access for people with mobility impairments and ensuring a high level of operational flexibility. The covered concourse -with magnificent views across to the vibrant Newcastle quayside and cityscape beyond - is the public focus of the building. This is a major new internal public space, an urban room open sixteen hours a day with cafes, bars, shops, box office, Music Information Centre and most importantly, informal performance spaces. An atmosphere of informality is encouraged by the reduction of back-of-house hospitality so that performers can mix with their audiences, students and children alike. The concourse is also part of a major pedestrian route linking the low-level Swing Bridge to the West with the new Millennium Bridge to the East, the principal pedestrian routes between Gateshead and Newcastle. This route is further strengthened by the principal artistic commission on the project - Kate Maestris colourful ribbon of glass that runs from the outside, through into the building and across the concourse, to reappear once again on the other side.

http://www. fosterandpartners. com/News/168/Default. aspx

The Sage Gateshead is one of the most important performing arts buildings in northern England, combining high-tech materials with a distinct shell-like exterior to produce a modern icon. The Sage Gateshead sits along the River Tyne. The Sage Gateshead was designed as three separate halls (Hall one, Hall two and the Northern Rock Foundation Hall) which do not touch, leaving gaps between the walls and ceilings for additional acoustic circulation. These gaps can be seen when standing on level one looking towards either side of the Northern Rock Foundation Hall. Foster then designed a canopy to fit over the top of all the individual rooms and the concourse level, resulting in the unusual shell or cloud shape that can be seen from the outside. The Sage Gateshead is designed to be a performing arts centre for all to enjoy, and has lots of different features that encourage visitors to explore the building. The Northern Rock Foundation Hall has a glass-panel front so that visitors can watch rehearsals and performances without interrupting the musicians. Sometimes performances are held on the main level, known as the concourse (or level O), which is a huge public space that is complimented by several cafes and restaurants and the wonderful view out towards the Millennium Gateshead Bridge and Tyne Bridge.

http://www. engagingplaces. org. uk/teaching %20resources/art72217

Usingthe Sage as a teaching resource

As a specifically designed performing arts and cultural centre, the Sage Gateshead can be used to provide teaching and learning opportunities in a range of subjects, including English, music, art and design, and maths. The

site of the Sage Gateshead demonstrates the way an inner-city industrial wasteland can be transformed into a vibrant cultural space, bringing the community together in many ways. The design of the Sage Gateshead itself utilized cutting-edge technology, mathematics, engineering and acoustic-design. Exploring the building’s many spaces can demonstrate how properly planned projects can produce truly outstanding high-tech results. The Sage Gateshead provides a range of half day educational programmes which include a tour of the building

http://www. engagingplaces. org. uk/teaching %20resources/art72217

Eden project, Cornwall UK

Nicholas Grimshaw

Sir Nicholas Grimshaw, CBE (born 9 October 1939) is a prominent English architect, particularly noted for several modernist buildings, including London's Waterloo International railway station and the Eden Project in Cornwall. In late 2004, he was elected President of the Royal Academy. Born in Hove, East Sussex, Grimshaw inherited an interest in engineering (one of his great-grandfathers was responsible for overseeing the installation of Dublin's drainage and sanitation system, while another built dams in Egypt). He is also reputed to have displayed an early interest in construction; his boyhood interests included Meccano, building tree houses and boats. He was educated at Wellington College. From 1959 to 1962, he studied at the Edinburgh College of Art before winning a scholarship to attend the Architectural Association School of Architecture in London, where he won further scholarships to travel to Sweden in 1963 and the United States in

1964. He graduated from the AA in 1965 with an honours diploma, and having entered into a partnership with Terry Farrell, he joined the Royal Institute of British Architects two years later in 1967. He worked with Farrell for 15 years before establishing his own firm, Nicholas Grimshaw & Partners, in 1980. In 1989, he won a RIBA national award for his design of the Financial Times printworks in east London. After designing Britain's pavilion for the Seville Expo in 1992, he was appointed a CBE in 1993, and the following year saw his Waterloo railway terminal awarded the accolade of 'Building of the Year'. That same year (1994) also saw him elected a vice-chairman of the Architectural Association, a member of the Royal Academy and a member of the American Institute of Architects. Grimshaw's architecture practice continues to grow; it has a global profile, with offices in London, New York, Melbourne and recently Sydney (as of December 2010). The work of Nicholas Grimshaw and Partners is the subject of a series of monographs published by Phaidon Press: Architecture, Industry and Innovation deals with the years 1965–1988; Structure Space and Skin covers 1988–1993; and Equilibrium looks at work up until 2000. Grimshaw is behind the National institute for research into aquatic habitats (NIRAH) design. Upon completion, this will become the world's largest aquarium.

http://en. wikipedia. org/wiki/Nicholas_Grimshaw

Background and content

Initially conceived as a UK Millenium Project for the public, the Eden Project has grown to become not only a tourist attraction, research and educational tool, but one for generations to come. From the start, the mission of the Eden Project has been to " promote the understanding and responsible

management of the vital relationship between plants, people, and resources, leading towards a sustainable future for all." The idea for the three biomes was thought up by Tim Smit who had worked on and was largely responsible for the successful restoration of The Lost Gardens of Heligan. This time his focus was to create something new, starting from scratch, that would amaze future generations. This structure aimed to educate visitors about the importance of a sustainable environment through the study and education of plants. To achieve this goal, Tim teamed up with the internationally known sustainable architecture firm of Nicholas Grimshaw and Partners. Together they explored many innovative ideas for the creation of the world’s largest biome. There are essentially three biomes in the Eden Project: the humid–tropics biome, the warm temperate biome, and the moderate temperate biome which is the land surrounding the two enclosed bubble-like structures. The humid–tropics biome, the largest biome at over 240m long, houses tropical plants from all over the world. Trails and various waterfalls enclosed inside the structure allow visitors to totally immerse themselves in a unique environment that would otherwise be impossible. The moderate temperate biome, though smaller still, allows visitors to enjoy and learn about plants and environments from all over the world.

http://www. caa. uidaho. edu/arch504ukgreenarch/CaseStudies/EdenProject1. pdf

Design and construction

The strict criteria for such an innovative structure created many design challenges. First, the structure was to be the world’s largest plant enclosure. This involved coming up with a design scheme that could span for great

distances without the use of a single internal support. Second, the structure must be as light as possible. This was needed for transportation reasons primarily because all the materials would have to be brought in from other cities, a long distance away. In addition, a lighter structure would put less stress on the soil and allow for smaller footings and less site impact. Last, the enclosure must be ecologically friendly helping it to be used as an educational demonstration of sustainability. Grimshaw’s solution to this challenge was to look at nature. He got his inspiration from looking at the honeycomb of bees and even the multifaceted eyes of a fly. These creatures used their surroundings most effectively to create a very strong, yet light-weight, solution. In addition, a geodesic dome-like structure would be able to conform to the expanding and contracting contours of the clayey soil.

http://www. caa. uidaho. edu/arch504ukgreenarch/CaseStudies/EdenProject1. pdf

The project took 2½ years to construct and opened to the public on 17 March 2001.

http://en. wikipedia. org/wiki/Eden_Project

Key design strategies

The Eden Project uses a variety of design strategies to help it complete its goal of sustainability. The official name for the bubble-like geodesic structure mentioned earlier is a " hex–tri–hex." Though the final structure looks very similar to half a sphere, the entire building uses straight planes with straight edges. It incorporates an outer shell of primarily hexagonal pieces, (some pentagons) which attaches to an inner network of triangles for stability. The design is so structurally stable that it does not need any internal supports

even in the 240m span of the largest biome. In addition, all the steel tubes that make up the grid-like network could be easily transported to the site in small pieces reducing costs. The structure transfers loads to the ground uniformly around its base which helps to eliminate large footings that otherwise might have been needed to support such a large enclosure. Energy efficiency-wise, the hemisphere shape helps to conserve the heating that is needed especially in the humid–tropics biome. This is because of the fact that a sphere has the largest amount of volume compared to its surface area of any form. Cushions of ETFE (ethyltetraflouroethylene) transparent foil are used for the glazing. This very lightweight material weighs approximately 1% of glass. In addition, its strength and the fact that it is self-cleaning makes it the perfect product to use for this project. Last, it also has excellent ultraviolet transmittance which is essential for the healthy development of the plants grown inside. This also means that it is important to wear sunscreen when hiking through the biome. Since each of the hexagonal pieces of the biome is a different size, Grimshaw worked with others to come up with a specialized 3D computer program that determines the dimensions of each piece. These data are then transferred to a machine that correctly cuts and labels each piece before it is shipped to the construction site.

http://www. caa. uidaho. edu/arch504ukgreenarch/CaseStudies/EdenProject1. pdf

Other precedents across the globe

In 1993, the first blobitecture building was erected: the Water Pavilion in the Netherlands, which was completely designed in CAD. Other large-scale projects followed in rapid succession, the most well-known of which is likely

the Guggenheim Museum Bilbao. This museum, located in Bilbao, Spain, was designed by renowned Canadian-American architect Frank Gehry. Opened to the public in 1997, it consists of various concave and convex curves. Since it is located on a port, it glass and titanium curves reflect the light from both the sky and water. Moreover, its curved silhouette resembles that of a ship. This modern-art museum strongly contributes to making Bilbao a Spanish tourist attraction.

http://shape. ezinemark. com/blobitecture-blob-architecture-4e6acf99956. html

Technically the first building designed through pure blob architectural techniques was the Water Pavilion, a temporary structure in Holland which stood from 1993 – 1997. It was built by Lars Spuybroek (NOX) and Kas Oosterhuis and was of a fully computer based nature. Its interior was fully electronically interactive – light and sound could be changed by visitors. http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. htmlThe United States has its own 'blobitecture' buildings. Seattle has the Experience Music Project museum, another Gehry-designed building, opened in 2000. Like the Guggenheim Museum Bilbao, this museum consists of seemingly random curves made up of sheet-metal. The building's undulations give it a fluid silhouette, perhaps as a tribute to the museum's musical exhibits. While the Guggenheim museum's shape reflects its port vicinity, the Project's shape can be summarized as " form follows function." In fact, Gehry directly attributed the building's shape to that of a smashed Stratocaster electric guitar, made famous by Jimi Hendrix. Unlike the Guggenheim, the Experience Music Project also incorporates more colors into its exterior

design, though its metal reflects as much light as the Guggenheim. Berlin, furthermore, has another " form follows function" blobitectural structure. This structure is the Philological Library, designed by English architect Norman Foster. Opened in 2005, the Library is part of the Free University of Berlin campus. In keeping with the university's intellectual purpose, the Library resembles a human brain. Like many other blobitecture buildings, its principal components are steel and glass.

http://shape. ezinemark. com/blobitecture-blob-architecture-4e6acf99956. html

Frank Gerhy took to Blob architecture in 1997 with his design for the Guggenheim Museum Bilbao and followed it up with EMP| SFM (known as the Experience Music Project for short) in 2000. Yet although these would to the untrained eye look the epitome of blob architecture, following its narrowest of definitions, they are not. The reason? They were designed using physical models rather than computer manipulations.

http://www. kuriositas. com/2011/01/blobitecture-rise-of-organic. html