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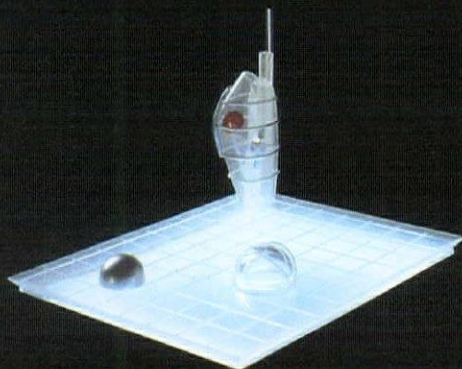
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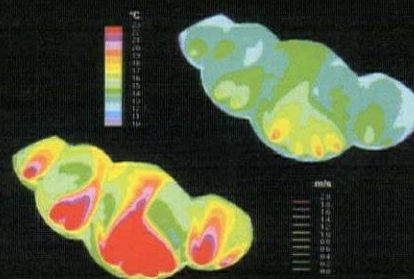
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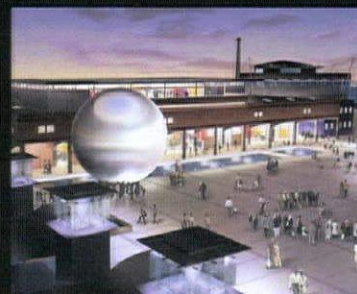


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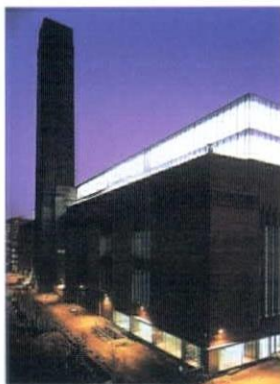
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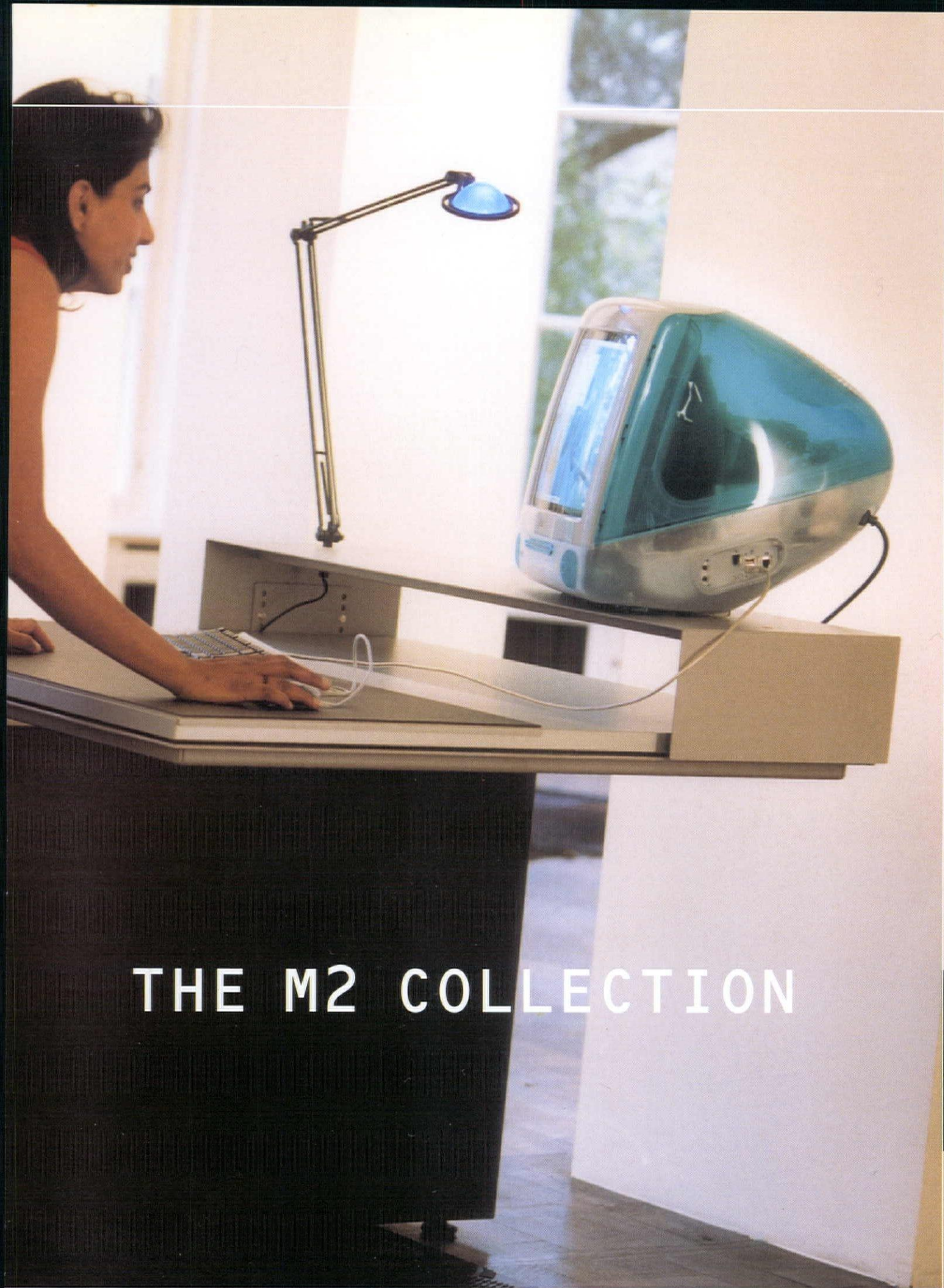
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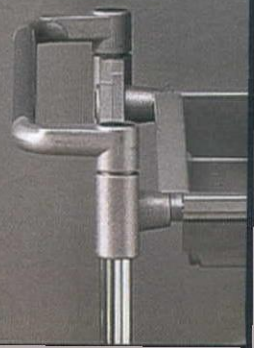
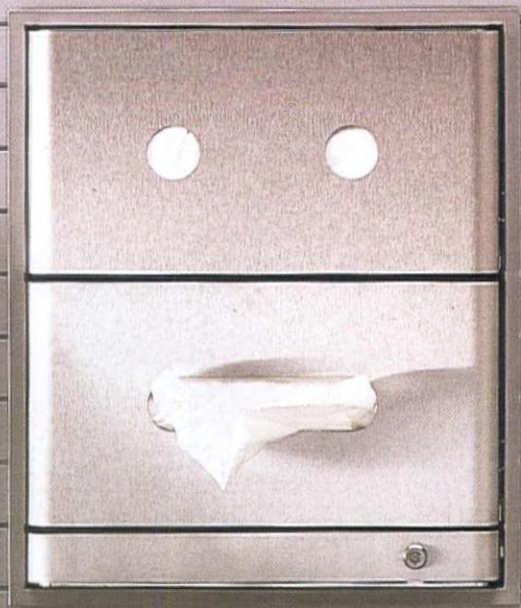




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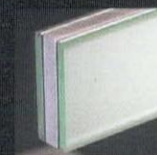
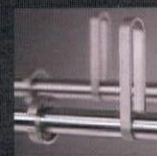
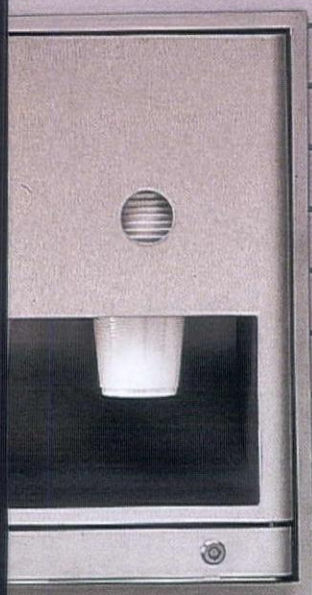
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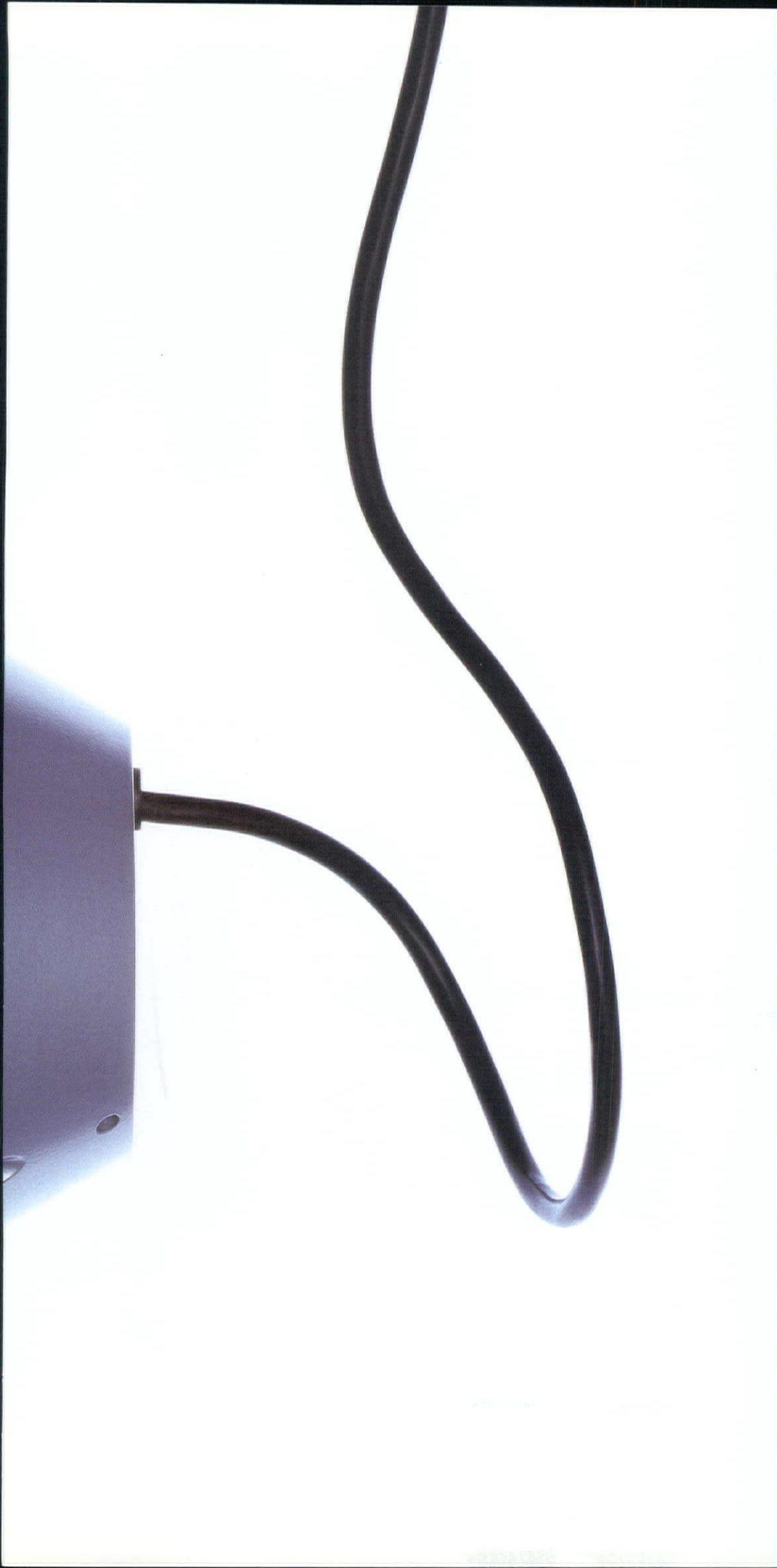
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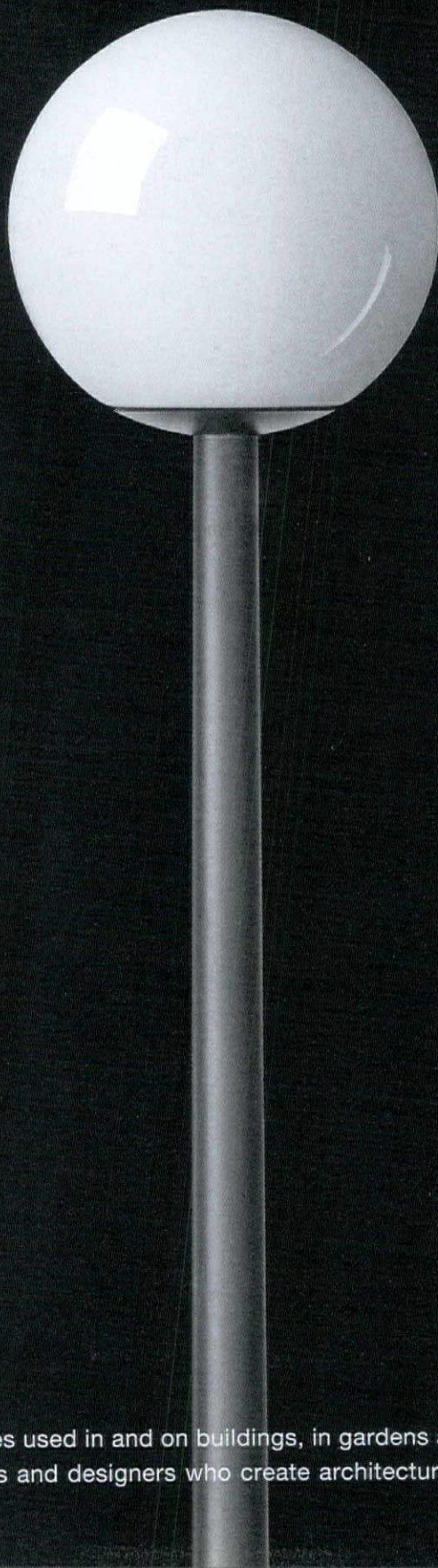


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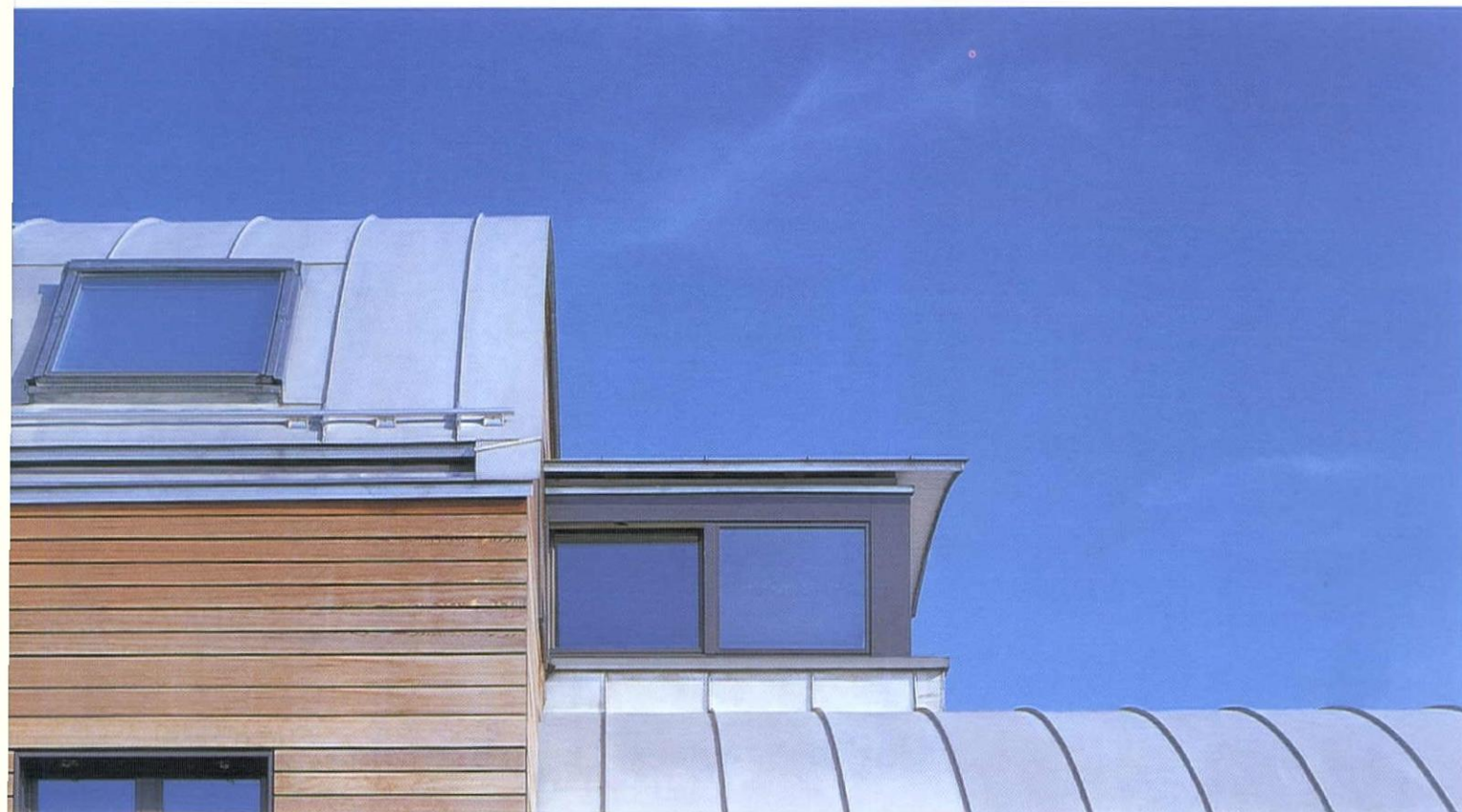
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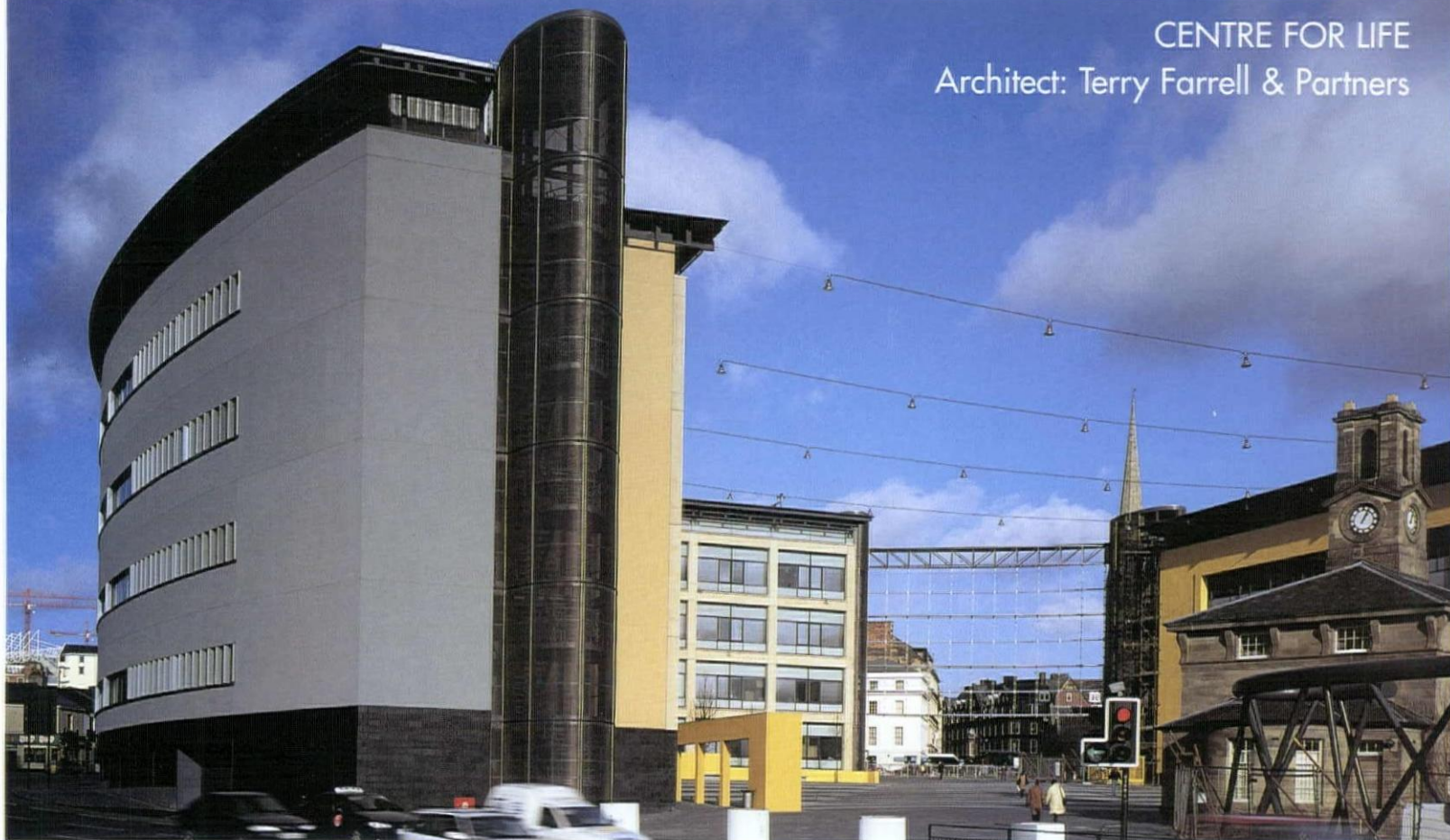
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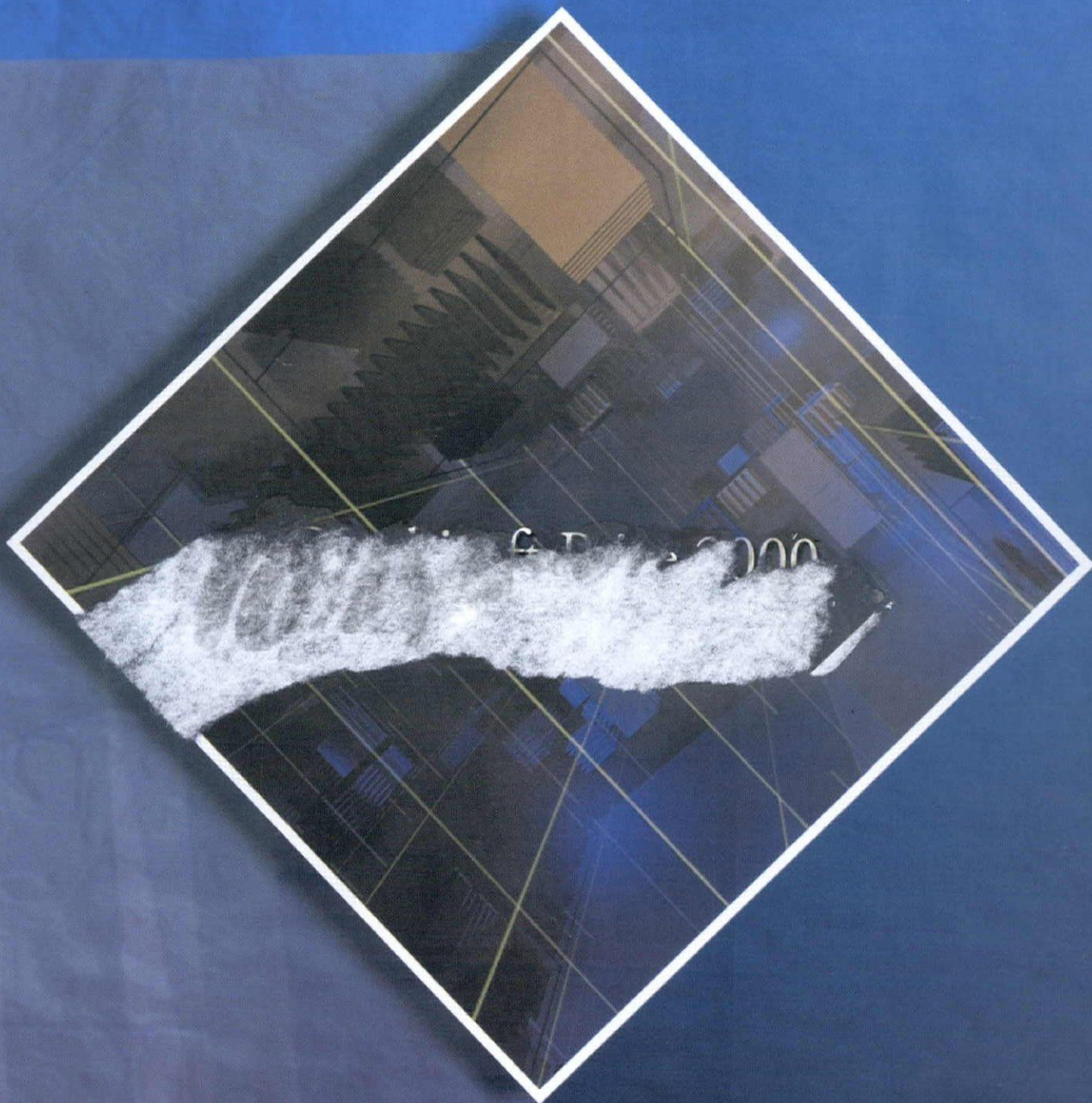


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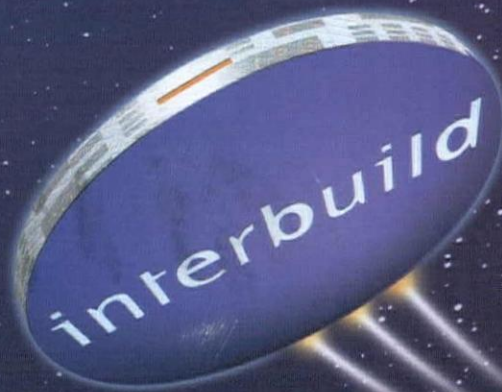
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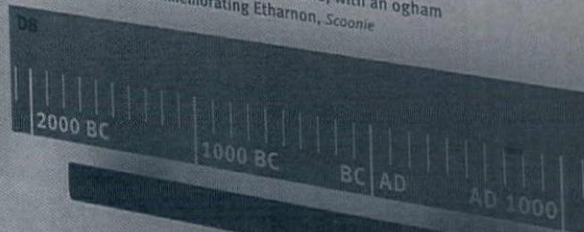
The deer hunt

The aristocratic deer hunt was a popular image on carved stones around AD 700 – 850. It celebrated the status of the person who had commissioned the monument. Scenes are stylised. Here, a hunting dog brings down a stag wounded by a spear thrown by a man on horseback. Two other mounted men, armed with spears, and a hunting dog are taking part in the chase.

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view

BRITAIN'S TATE GALLERY IS REORGANIZED AND THE OLD BUILDING IS RELAUNCHED WITH A MAGNIFICENT EXHIBITION WHICH CELEBRATES THE LIFE AND VISION OF JOHN RUSKIN, THE NATION'S GREATEST CRITIC. THE MILLENNIUM WHEEL DOMINATES THE LONDON SKYLINE. SPECTRUM EXHIBITION, THE BEST OF FURNITURE DESIGN.

On New Year's Day 1844, John Ruskin's present from his father was Turner's 'Slavers throwing over the Dead and Dying – Typhoon coming on'. It was an extraordinary and magnificent gift: awash alike with brilliant sunset colour, the swirling misty sea of sharks, squids and despairing people; it was simultaneously a celebration of the wonders of nature and a dramatic artistic attack on slavery, which had nobly been abolished in the British Empire by the arguments of people like Brougham and Wilberforce 33 years before the painting was made in 1840.

In a sense, the picture is an emblem of Ruskin's life and character: in the swirling waves, despairing limbs, light and paint there is already a sketch of the interconnected tissue of ideas and feelings about reality, society, art and nature which informed Ruskin throughout his life. The new exhibition* at London's Tate Gallery at Millbank is an astonishing attempt to portray the mind of a vastly prolific, often perverse genius who inspired as diverse a range of apostles as the Pre-Raphaelites, Proust, Morris, the Symbolists, Tolstoy, the Labour Party and Gandhi and hence some of the make-up of modern India and Britain.

The Tate enterprise is a portrait, but inevitably less than complete, because it has to focus on the visual aspects of Ruskin's work, and cannot easily come to terms with his social and scientific theories. Nor can it clearly tell how architecture was the hub of all his thought. It was by brooding on the Nature of Gothic in the sixth chapter of the second volume of *The Stones of Venice* that he began to evolve his riposte to the horrors of industrialization with the ideal of the nobility of craftsmanship, the dignity of the individual worker and the necessity of having a system of thought which could combat the destructive system. (The chapter was later reprinted as a popular pamphlet for working people.)

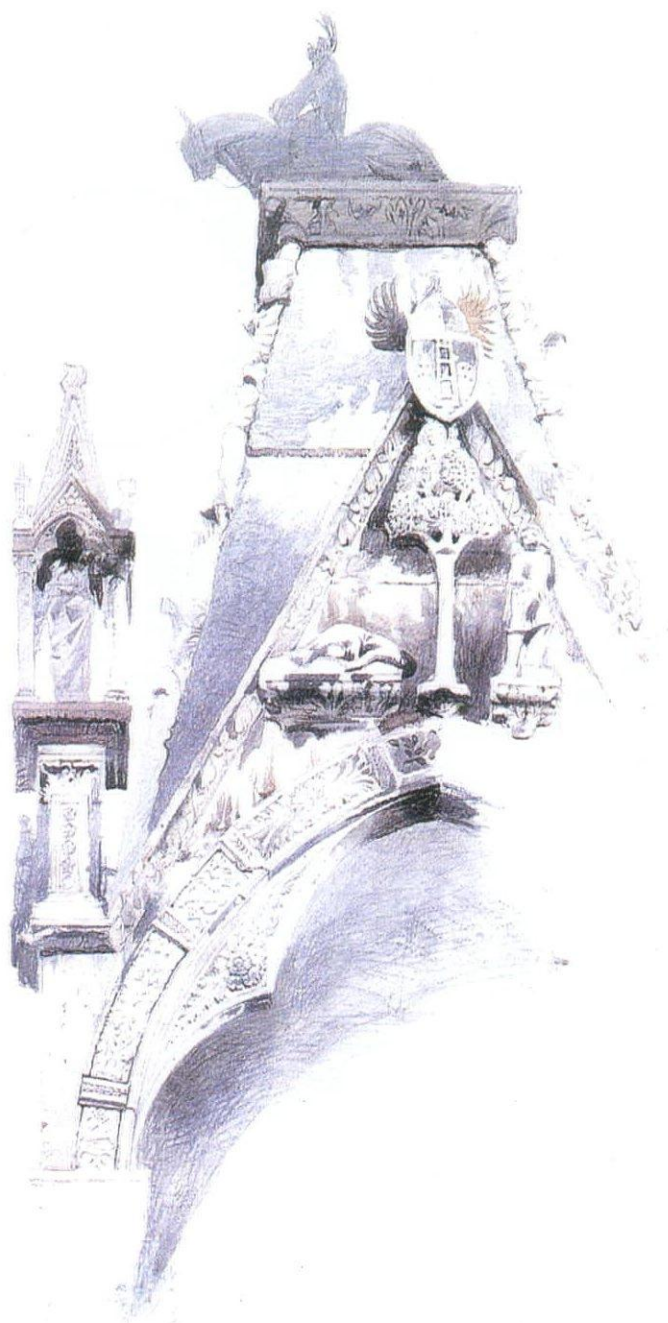
But architecture does figure largely in the exhibition – wonderfully in his own drawings, particularly those of Venice, where there is a great tenderness and understanding of the great decaying fabric of what had once been the world's richest city in the fourteenth century by a man who was a citizen of its counterpart five hundred years later. He could have

been a splendid topographical artist in his own right, but luckily, his wealth (which came from Spanish Domesday sherry) allowed him to use all his talents: writer, critic, savant, collector, painter, theorist and, above all, visionary.

He was the man who could SEE: ourselves and the world that makes us. What he saw is

shown in pictures from his own collection, those he admired, and many he made himself.

Many critics have commented that the Tate show demonstrates incompatibilities in Ruskin's sensibility. How could, they ask, he have loved the swirling chaotic impasto of Turner's later seascapes and, at the same



Ruskin: North Gable of Can Mastino's tomb, Verona 1852 – the Gothic romance at its most intense.



Kingfisher ca 1870. Ruskin was one of the first to articulate environmental concerns.

time, the flat, thin, precisely drawn figures of the Pre-Raphaelites? The answer is simultaneously simple and complex. Most of us in the pluralist post-modern era can see that both are wonderful in different ways. But what is very difficult to appreciate is that Ruskin saw them as complementary, and that Turner was the father of modern art. In his eyes, they were striving to capture the essence of nature (and humanity). Art should be true to reality, but at the same time it should idealize it: make us aware of the awesome complexity of what he had been brought up to believe was God's creation (to the extent that he was made by his mother to read the Bible from end to end repetitively). And art should teach how we can work in harmony with nature and each other.

The Tate show is a triumph. Homage to the country's greatest critic is a most appropriate way of signalling the new role of Tate Millbank** as the national repository of British art. Richard MacCormac (the architect of the splendid Ruskin Museum in Lancaster AR June 1998) has designed a beautifully lit and poetically coloured (by Jocasta Innes) maze of spaces, which lead you through the mind of the great man from the luminous brilliance of his youth to the dark and terrible days of his madness.

The exhibition is as near as you will ever get to seeing as Ruskin saw. It has been brilliantly put together by Robert Hewison, Ian Warrell, and Stephen Wildman.

Go and see it.

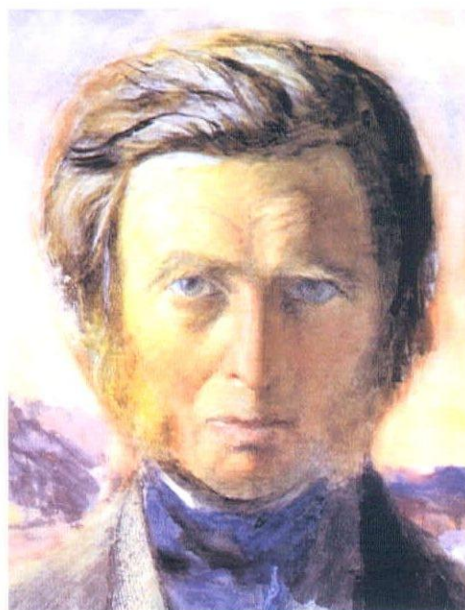
PETER DAVEY

*Ruskin, Turner and the Pre-Raphaelites. Until 29 May.

**The other Tate, which holds the modern collections, is about to open at Bankside (p48). When the Millbank building was opened in 1897, contemporary British art was the cynosure of the world, and there was no incompatibility between the dual function of being British and modern.



Ruskin: marble inlay of Casa Loredan, Venice 1845. He could have been a notable topographical artist.



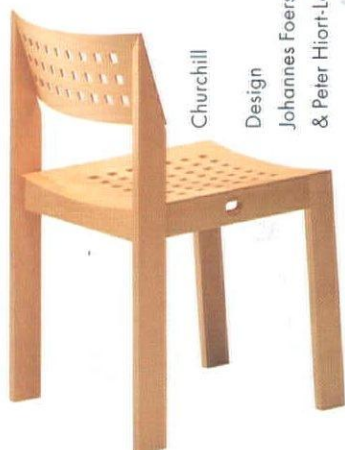
Self-portrait 1879. The storm clouds gather. Image is consciously unsymmetrical: Ruskin hated symmetry.



Ruskin: part of St Mark's, Venice after rain, 1846. An incomparable sensitivity for season and time.

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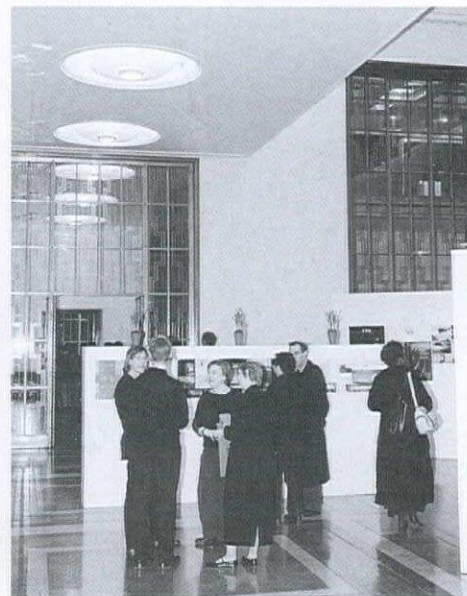
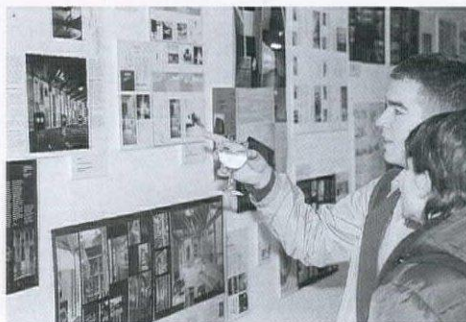
Peter Davey orating, with publisher Neil Williams.

ar+d @ RIBA

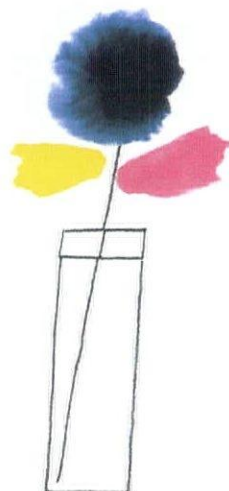
Held at the RIBA, the exhibition of winning entries for the first ar+d Award for Emerging Architecture has proved a great success.

The exhibition featured the 21 winners together with a selection of the more interesting entries. A private view last month drew an enthusiastic crowd, here seen enjoying both the exhibition and the AR's hospitality. The award celebrates excellence in completed work by architects under 45. Last year's competition attracted over 900 entries and full details of how to enter this year's award are published on p3. The jury will include Odile Decq, Will Bruder, Erick van Egeraat, Christoph Ingenhoven, Adalberto Dias and Peter Davey.

For more information www.arplust.com



Photographs: Charles Glover



Spectrum 2000, the annual furniture and design fair, will be taking place from 17 to 20 May in the Commonwealth Institute on Kensington High Street. As in previous years, the AR will be giving an Award for Excellence to the product new to the UK and judged the most worthy by an eminent panel of architects and designers, including Rick Mather of Rick Mather Architects and Dinah Casson of Casson Mann.

With the release of the whole top level of the Commonwealth Galleries, the event will be the largest yet, including 20 new companies and bringing the number of exhibitors up to 130. The exhibition will be open from Wednesday to Friday 10am-9pm, and on Saturday 10am-6pm when there will be a children's club for visiting families. Pre-registration can be arranged from now onwards, tel: 0870 751 479. Information about special hotel and travel discounts, tel: 020 7372 2001. Spectrum website: www.spectrumexhibition.co.uk



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THE ARCHITECTURAL
REVIEW
MIDDLE EAST

view



Massimiliano Fuksas has won a major urban regeneration competition for the EUR district in Rome. The jury included Norman Foster. Fuksas's scheme is a transparent slab like a huge fish tank containing flamboyantly organic forms.

competitions & awards

Two of the latest international competitions for architects and students.

Two Tiber bridges

Registration: 3 May 2000
Submission: 3 May 2000
Entry Fee: Euro 130
Awards: Euro 90 000 in total
Eligibility: architects and engineers from the EC, Switzerland, Norway and Liechtenstein

Jury: *Elias Torres Tur, Guy Nordenson, Sergio Crotti, Marco De Michelis, Mario Martone, Roberto Linetti, Vittorio Nascé, Umberto Riva and Giuseppe Manacorda*

The Municipality of Rome has announced a competition for

the design of two new pedestrian bridges crossing the river Tiber, with the aim of connecting and restoring two urban areas of strategic importance. Spanning approximately 170m, the Ponte della Musica in Flaminio will connect Lungotevere Flaminio on the left bank with the neighbouring Via Capopreti on the opposite side. The new bridge will bring together two parts of the evolving urban centre, improving the social and cultural life of the city. Spanning approximately 100m, the Ponte della Scienza in Ostiense will connect the Ostiense bank with the Lungotevere dei Papireschi. The new pedestrian link will restore a sense of cohesion to two former industrial areas.

Further information and registration:
Ufficio Concorsi di Architettura
Piazzale Victor Hugo 8
00197 Roma
Italy
Tel: +39 06 8845313
Fax: +39 06 8848279
Email:
pontipedonali@comune.roma.it
www.comune.roma.it/dipterritorio/competition.ponti

Small Public Spaces

Registration: 21 July 2000
Submission: 21 July 2000
Entry fee: none
Total prizes: ¥ 2 600 000
Eligibility: open to architects and students

Jury: *Toyo Ito, Tetsuo Naito, Masaru Okamoto, Itsuko Hasegawa, Riken Yamamoto, Kengo Kuma and Tomoyuki Inokuchi*

In all cities and human societies, small public and semi-public spaces exist in various forms. Although they can have many diverse functions, such spaces help society to function and also humanize our cities. This competition sets the challenge of designing small public spaces using glass as the principal material.

Further information and registration:
Shinkenchiku-sha Co Ltd
2-31-2 Yushima
Bunkyo-ku
Tokyo 113-8501
Japan



Marks & Barfield's Millennium Wheel (funded by BA, not the Millennium Commission) opened last month on the Thames almost opposite the Houses of Parliament. Universal acclaim for its elegance and the wonder of its views followed.

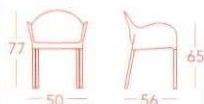


ed. Paolo Monti | ph. Santi Callegari

SAUSALITO, CALIFORNIA - 5.20 PM: SIMON, A PRODUCER, AT THE END OF LONG DAY DIVES HEADLONG INTO HIS JOB.

Cloud design Carlo Bartoli

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For more details enter 19 on AR enquiry card

view

letters

TORONTO HOUSE DRAWINGS

SIR: Your plans of the Hill House in Toronto (AR March 2000) seem to bear no relation whatever to your photographs. Are you checking to see if your readers are paying attention? Perhaps Shim Sutcliffe Architects are playing a similar game with you?

In either case, please eliminate this sort of sloppiness as it mars an otherwise stimulating and worthwhile publication.

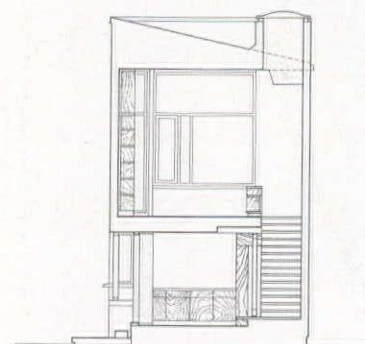
Yours etc

MICHAEL LEVEY

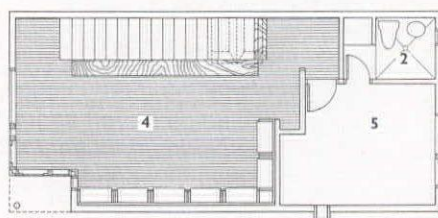
Alan Camp Architects, London

As Michael Levey and many others noticed, we inadvertently published the wrong set of drawings for Shim Sutcliffe's Hill House in Toronto (AR March, p85). It was entirely our fault and somewhat chastenedly, we reproduce the correct set below. The article appears with the correct drawings on our website www.arplus.com. Apologies to all.

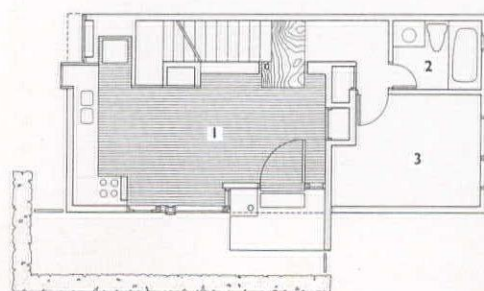
- 1 kitchen/dining room
- 2 bathroom
- 3 bedroom
- 4 library
- 5 office



cross section



first floor plan



ground floor plan

ENLIGHTENING THE DOME

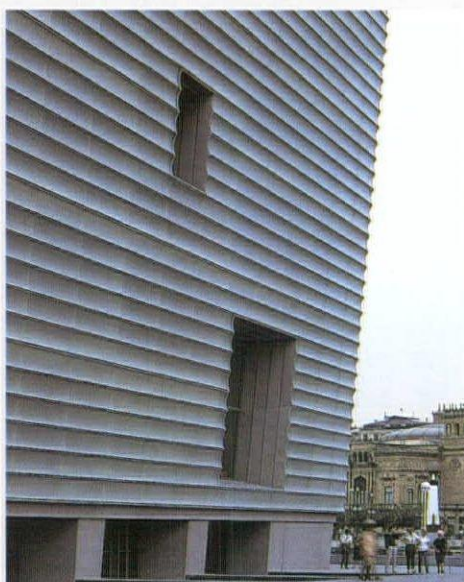
SIR: We note that an article on p86 of the January AR implies that the design of the 'afterburner' luminaire at the Millennium Dome was by Concord Lighting.

This detail, along with all the other architectural lighting details in the Millennium Dome (excluding the zones and retail areas), were conceived by our practice in conjunction with Richard Rogers Partnership and Buro Happold. Concord Lighting's role was to manufacture some of the fittings.

Yours etc

MARK MAJOR

Speirs and Major, London



MAY

The richness and diversity of materials forms the subject of the May issue. The basic palette of building materials has expanded greatly in recent times, fired by architectural imagination and driven on by increasingly sophisticated technology. This has had a profound effect on architecture. We look at Rafael Moneo's Kursaal auditorium in San Sebastian, clad in a translucent skin that sensually diffuses light to create a magical interior realm. In Tel Aviv, Zvi Hecker makes inventive use of humble local sandstone in his Palmach House, a veteran's memorial centre. In Biel, Meili + Peter's Wood Engineering College is a typically precise and beautifully detailed timber structure in the contemporary Swiss tradition. And in Moscow, Ahrends Burton & Koralek's British Embassy is a sensitive investigation of materials in a major new urban building. Plus the familiar stimulating mixture of Interior Design, House and View. Buy this and 11 other issues by completing the enclosed subscription form.

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Procedure

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Further information

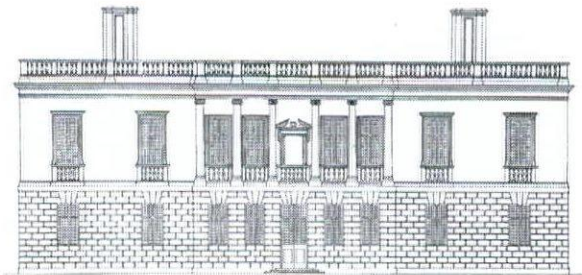
Task, competition documents, application, submission requirements, jury, prize money as well as deadlines can be found under www.ethworld.ch and www.phase1.de.

www.ethworld.ch

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www.aaschool.ac.uk

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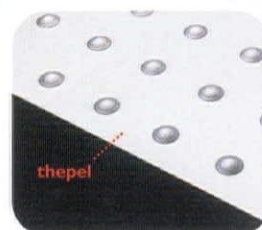
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EMERGING ARCHITECTURE AWARD

Inaugurated in 1999, the ar+d award was conceived by The Architectural Review and d line™ *international as*, the distinguished Danish architectural design firm. Intended to bring wider international recognition to a talented new generation of architects and designers under 45, it attracted entries from over 50 countries, representing every continent. Work submitted ranged from small domestic conversions to large public buildings, light fittings to landscapes.

WINNING ENTRIES 1999





ar+d²⁰⁰⁰

Emerging Architecture

ENTRY FORM Deadline: 12 September 2000

Please complete this entry form as clearly as possible.

Photocopies of this form may be used. Complete in capital letters.

CONTACT NAME FOR ENTRY

TITLE FIRST NAME

LAST NAME

FIRM/PRACTICE

ADDRESS

CITY/TOWN

POST/ZIP CODE

COUNTRY

PHONE NUMBER

FAX NUMBER

EMAIL ADDRESS

NAMES OF THE DESIGN TEAM

1

2

3

4

5

PROJECT NAME

CITY

The ar+d team will be sending information about all the winning entries to media worldwide. Please let us have your preferred choices on your local relevant media:

1 ARCHITECTURAL MAGAZINE

2 NEWSPAPER

code 1000

The world's leading emerging architecture award

JURY

The Jury will be:

ODILE DECOQ

Odile Decq Benoit Comette,
Paris, France

WILL BRUDER

William P. Bruder Associates,
Arizona, USA

CHRISTOPH INGENHOVEN

Ingenhoven Overdiek & Partner,
Düsseldorf, Germany

ERICK VAN EGERSAAT

Erick van Egeraat Associated Architects,
Rotterdam, The Netherlands

ADALBERTO DIAS

Adalberto Dias Architect Ltd,
Oporto, Portugal

PETER DAVEY

Editor of The Architectural Review

ELIGIBILITY

1 Who Can Enter

Architects and other design professionals whose qualifications are recognized by their local accreditation organization, provided that they are 45 or younger during the Year 2000.

Entries are encouraged from individuals, groups, partnerships, and those working for larger practices. Those working for larger practices must provide written evidence from their principal in the employing office guaranteeing that the work is that of the entrant(s).

2 Completed Work

ar+d emerging architecture celebrates excellence in completed work. Entries can be made for any building, interior, landscape, urban or product design.

3 Categories

Categories will not be decided beforehand, but decided on by the Jury. Entries to the 1999 award represented some of the following areas:

- Buildings – new build and refurbishment: offices, shops, schools, houses, housing, industrial, transport, restaurants, recreational, cultural, municipal and religious
- Interiors – new build and refurbishment: similar to building category, in particular restaurants, shops, houses, clubs and galleries
- Urban design
- Product design – light fittings, architectural design, furniture, cladding, and structural systems
- Street Furniture – lights, bus stops, bollards, post boxes, signs
- Landscape – soft and hard
- Bridges
- Temporary or portable structures – exhibition stands

4 Age Restriction

The age limit has been chosen on the basis that many emerging architects are unable to realize designs or develop an original vision before that time, either because of the long education and training period, or because of lack of opportunity.

WINNING ENTRIES

5 Prizes

The total prize money is £10 000 sterling with the overall winner receiving £5000. The Jury may choose a number of other winners and highly commended entries (there were 20 winners in 1999).

6 Publication

Winners of the ar+d emerging architecture awards and others highly commended by the Jury will be published in the December 2000 issue of The Architectural Review and on the ar+d Internet site, www.arplusd.com.

7 Prize Giving Ceremony

The ar+d emerging architecture prize giving will be held at the new Danish Design Centre in Copenhagen on 26 October. The overall winner will receive a trophy designed by Knud Holscher, and will be invited by The Architectural Review and *d line™ international* as to the event.

8 Worldwide Exhibition

Winning and other highly commended entries will be exhibited at the prize giving, and subsequent exhibitions in major cities worldwide (schedule to be confirmed). Winning boards may be reproduced to protect originals.

9 Other Media

The ar+d team will provide information on all winning entries to other architectural magazines, newspapers and relevant media worldwide. Please help us by choosing your preferred local media on the entry form.

10 Providing Additional Materials for Publishing

Additional photography, drawings and other information from winning entrants will be urgently requested for the December publication during the week beginning 1 October. Entry will acknowledge that The Architectural Review and *d line™ international* as have the right to reproduce materials in whole or part without payment of copyright (where we are made aware of their names, photographers will be acknowledged).

ENTRY REQUIREMENTS

11 Entries

The maximum number of entries from any individual, group, partnership or larger practice is three – with each entry showing only ONE scheme. As there is a new Jury, work entered for the 1999 award may be re-submitted on new boards. Incomplete work, unrealized schemes, projects, CD-ROMS, videos, transparencies, models, prototypes and multiple schemes entered on one board will NOT be accepted.

12 No Entry Fees

There are no entry fees to the ar+d award to encourage the widest possible selection of entries from around the world.

13 Boards

Each entry should be mounted on two A2 sized boards, and must include photography (in either colour or black and white), drawings, and if appropriate a brief written description in English. The identity and location of the submission is helpful to the Jury. Maximum board size (portrait) is 420mm x 594mm or approximately 16.5in x 23.4in – preferably lightweight art board or equivalent.

14 Anonymity

To ensure anonymity in judging, no names of entrants or collaborating parties may appear on any part of the board. On receipt, each board and entry form will be allocated a number allowing identification – for extra security please include your international telephone number on the back of the board. Only after the Jury has made its decisions, will the identity of the winners be revealed.

15 Entry Forms

Each submission must have a separate entry form. All entrants must be named in the submission. Please copy the entry form where necessary. Complete the forms clearly and enclose in a sealed envelope attached to the board.

16 Entry Deadline

Deadline for receipt of entries is 12 September. To ensure timely receipt, we recommend using a carrier that guarantees delivery. All entries received will be acknowledged on our website at www.arplusd.com/received.htm as soon as possible after the deadline.

DELIVERY AND COURIER

17 Send to:

Entries should be properly packaged and clearly marked 'ar+d' on the outside. They should be sent to:

The Architectural Review,
151 Rosebery Avenue, London
EC1R 4GB, United Kingdom.

18 Documentation

Please ensure that entries are delivered by the closing date. Entries posted on the closing date will be accepted but must be received before 15 September. IMPORTANT:

Your entry must be marked as NCV (no commercial value) on any courier documentation – the ar+d emerging architecture award will NOT accept any courier charges or taxes resulting from delivery. Personal deliveries to the AR editorial offices are accepted during normal working hours.

19 Return of Entries

Entries will not be returned. The ar+d emerging architecture award assumes no liability for loss or damage of entries.

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call for entries



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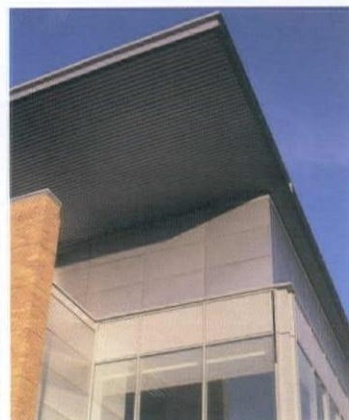
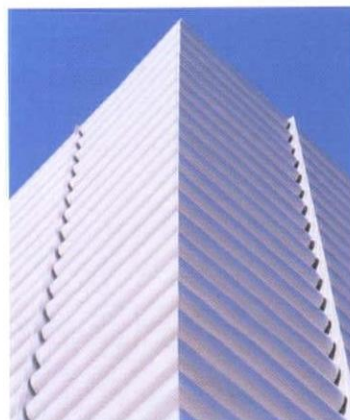
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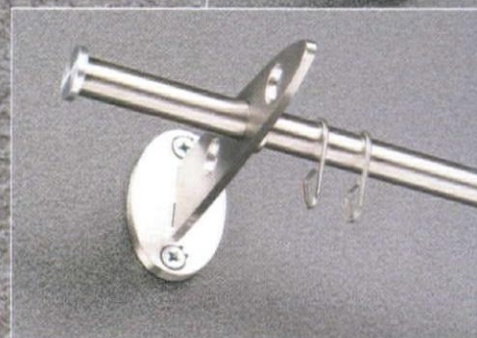
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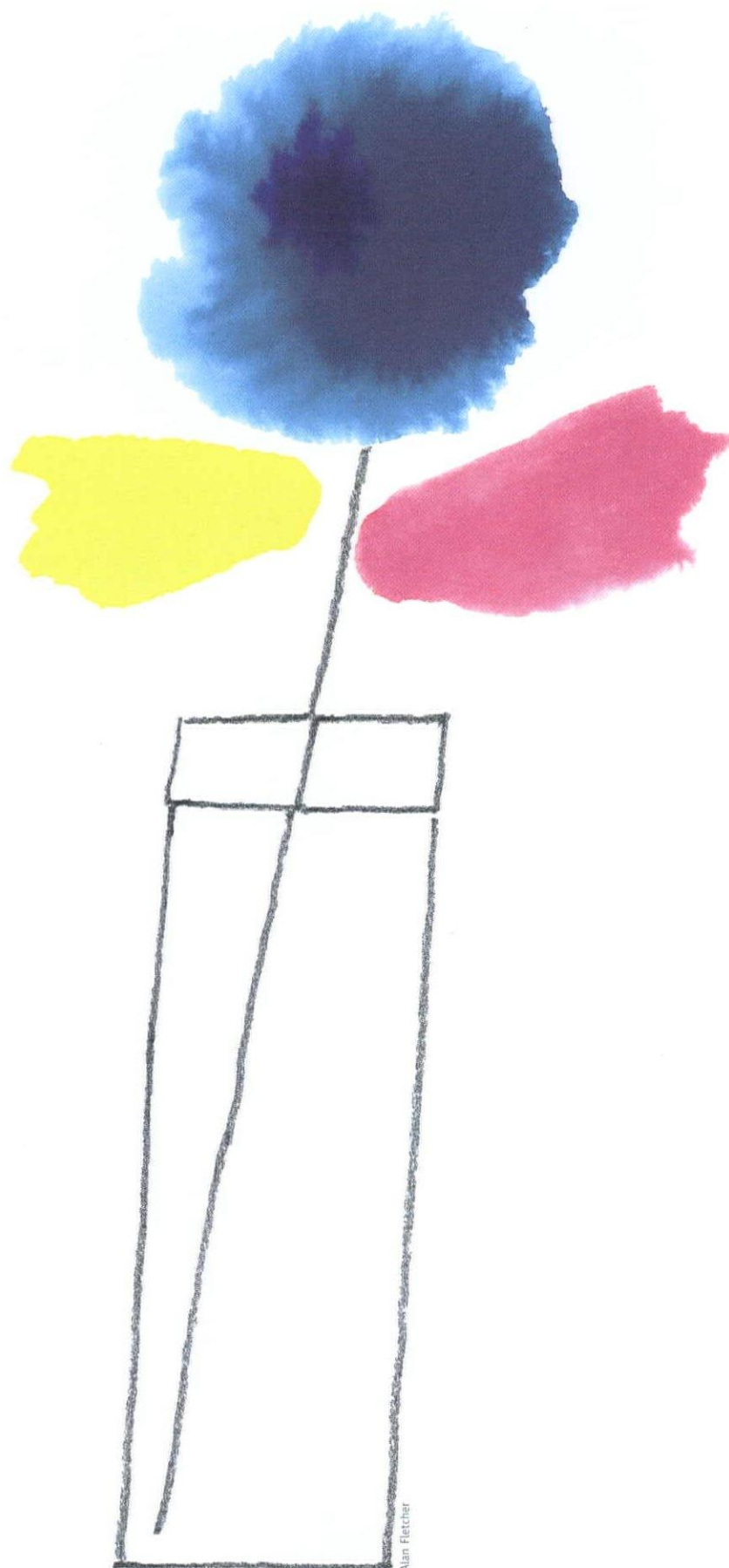
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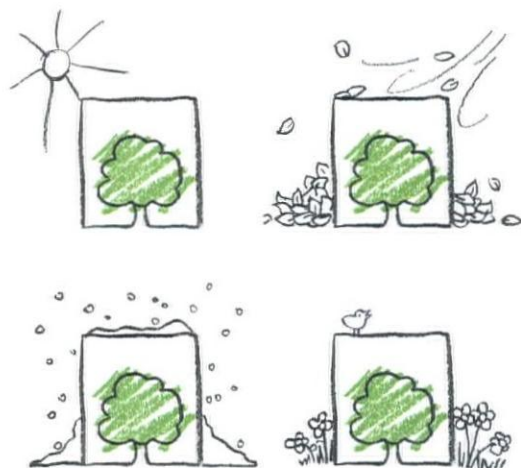
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millennium projects



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The UK in Y2K

WHILE THE DOME MAY BE THE MOST WELL KNOWN SYMBOL OF THE UNITED KINGDOM'S CELEBRATION OF THE MILLENNIUM, NUMEROUS PROJECTS ARE HELPING TO TRANSFORM THE REST OF THE COUNTRY.

The year 2000 has given us a wonderful opportunity to reinvigorate the fabric of the United Kingdom. Perhaps the most famous symbol of the Millennium is the Dome, which became the focus of world attention as midnight struck on New Year's Eve. The huge and elegant structure is a triumph of British architecture, engineering and construction; its contents are innovative products of design and entertainment talent.

The Dome is merely one example of a magnificent wave of imaginative new work which has reinvigorated the whole of the United Kingdom with new buildings for the arts, sciences, sport and leisure. But the Millennium Commission has not used its National Lottery money just to support major works. It has supported and enabled 190 major projects but hundreds of smaller schemes too, from improvements to village halls and parish centres to local parks, salmon ladders in the Thames and a Hindu temple in the Midlands. These are funded as projects to enhance local life and to help regenerate communities which may have suffered from many years of neglect.

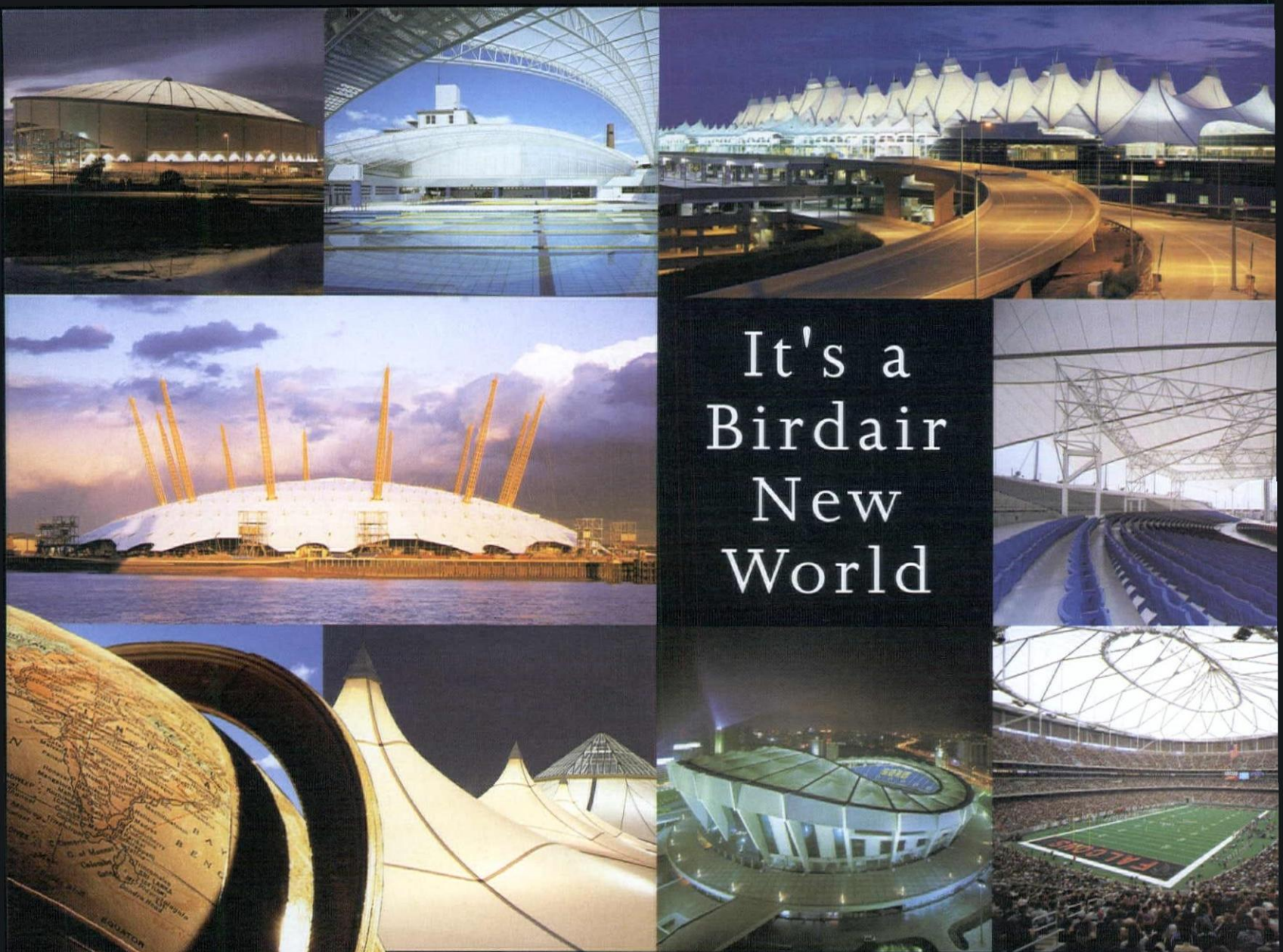
The bigger projects covered in this special issue of *The Architectural Review* are of course also intended to help foster local community, but they have regional and national importance as well. As with the smaller and more locally influential buildings, the major ones span a very wide range of purpose and location. They include the Belfast Odyssey Project and large sports stadiums in Cardiff and Glasgow. There are new contributions to the understanding of science, like the Eden Project in Cornwall, the Millennium Seed Bank (an outpost of Kew in Sussex), the Dynamic Earth Centre in Edinburgh and the National Space Science Centre in Leicester. The arts and litera-

ture have received major investments for projects of global significance: for example, the Lowry Centre in Salford celebrates one of the region's most distinguished artists with a new complex of theatres and galleries; the new Tate Modern on Bankside re-awakens a well-loved landmark and transforms it into a dramatic and elegant home for one of the greatest collections of modern art in the world. Similarly, the British Museum is being transformed with a radical and bold new strategy which respects and enhances the old buildings.

As well as funding these major buildings, the Millennium Commission has empowered more diffuse schemes which will have radical effects on regional cultures. The University of the Highlands and Islands project is a good example which brings much needed on-line education facilities to rural Scotland in small new buildings and conversions which will form a network of local centres of excellence; the city centres of Coventry, Manchester, Durham and Sheffield will be remade; Portsmouth Harbour will be restored to the urban presence it had in the eighteenth and nineteenth centuries; the Forth-Clyde and Union Canals will be re-awakened as leisure links across Scotland's central belt.

The Millennium Commission's programme will not be completed all at once. Some work is already finished, but the whole programme will not end for at least two years. It takes time to reinvigorate our society's relationship with our culture, our buildings and our environment: time to rediscover a rewarding public realm, with a legacy that will last for generations to come.

RT HON CHRIS SMITH, MP
Chairman, Millennium Commission



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Andrew Grant Associates (see p84)

Meeting the Millennium

THE UK'S MILLENNIAL EFFORTS HAVE BEEN PARODIED AS VAINGLORIOUS AND UNNECESSARY BUT THEY HAVE A NOBLE SIDE. THIS ISSUE CELEBRATES THAT, AND PROVIDES A SNAPSHOT OF BRITISH ARCHITECTURE.

Lotteries have been good for British architecture. In the eighteenth century, enough money was raised by a gambling scheme to make eventually Robert Smirke's wonderful British Museum building (p62). Now, some of the money from the enormously profitable contemporary Lottery has been channelled by the Government to building memorials to mark the Millennium.

In some ways, the enterprise is absurd. Why AD 2000? It is not as if Britain is any longer a very Christian country. Why set-piece memorials, when so much of the infrastructure of the country is rotting after many years of evil Thatcherite rejection of the very notion of society? Why embrace a mechanism which systematically transfers cash from the poor and under-educated (who believe that they may be beneficiaries of Lottery bonanzas) to the relatively rich and better taught, those who enjoy art galleries, science centres and the gentle pleasures of thought?

Yet there is a noble aspect to the affair. Britain may now be the fourth largest economy in the world, but it has been clapped out in many ways since the Second World War, and the average income of its inhabitants has slipped drastically compared with many other countries: results can be seen in the dirt and squalor of almost every British city. The American commentator who remarked that the Dome was an attempt to evoke a notion of Britain as it stood as the richest and most powerful nation in the world at the beginning of the last century was not entirely wrong. But what that observer had not looked at was the extraordinary parallel projection of energy and money into an attempt to re-animate the whole of the United Kingdom.

Rightly, many of the resources have been channelled to decayed industrial areas. Frank Gehry's splendid Guggenheim in Bilbao, the previously decaying Basque mill town, shows that a key building can help to switch a city (AR December 1997).

We must hope that Wilford will do the same for Salford with the Lowry Centre (p80) and in the same way, Wilkinson's reworking of steelworks in Rotherham (p68) and Grimshaw's Eden in Cornwall (p76) will help cause local renaissance. But as Chris Smith, Secretary of State for Culture, Media and Sport, says (p45), the British Millennium building programme is much more extensive than what we show in these pages. It ranges from grand affairs like the Bankside Tate (p48) and Edinburgh's Dynamic Earth (p58) through a national bicycle network and the physically disseminated Scottish University of the Highlands and Islands (p105), to church bells and village halls, none of which we have space or ability to illustrate. Here you can see the largest projects (those to which the Millennium Commission has given more than £15 million).

The state should invest in architectural imagination because it can vastly improve the quality of life. But there are caveats about Millennium work. Systems of procurement inherited from Thatcher's days have ensured that not all the buildings will be as fine as their architects envisioned. Imagination has often been diluted by systems like the Private Finance Initiative. Quick production of bulk and economic short cuts have reduced strength of thought and fineness of detail that make a building memorable and enjoyable for many generations.

But however difficult their delivery may have been, and however varied their quality, the Millennium Commission's efforts are admirable. They have helped to re-awaken a notion of the *res publica*: a decent realm which we can all share with dignity. This issue is a snapshot of the nature of a nation struggling to discover physical decency and honour. How sad that the Commission (with which we have collaborated to make this issue) is not being allocated more Lottery funds. P.D.

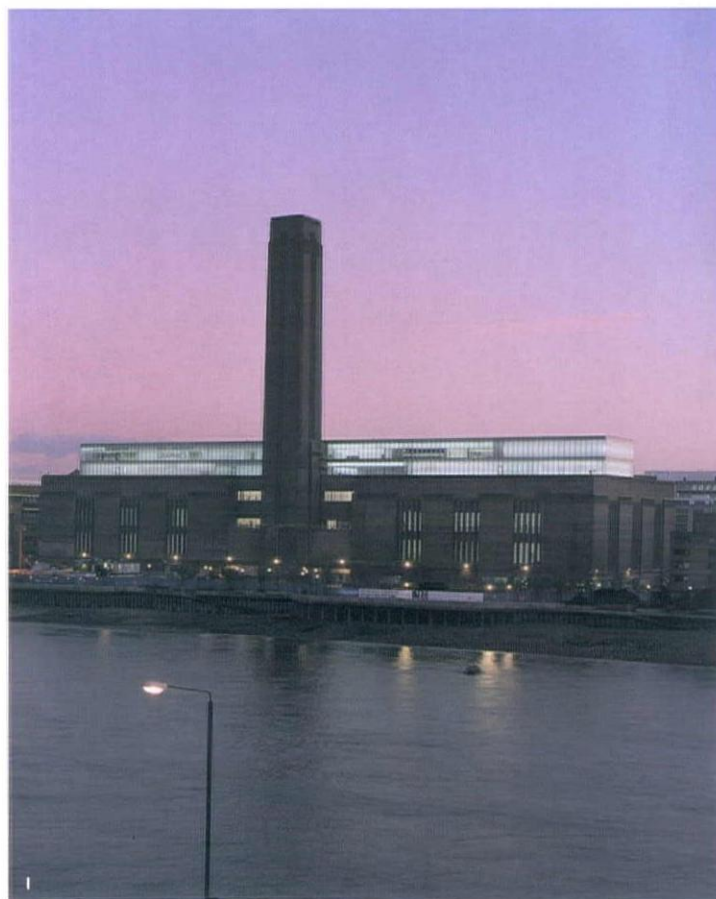
TATE MODERN, BANKSIDE, LONDON

ARCHITECT

HERZOG & DE MEURON

1 The glowing horizontal 'light beam' of the revitalized Bankside Power Station heralds its rebirth as a vast new repository for modern art.

2 Cavernous former turbine hall forms the building's focal, cathedral-like space. The ramp at the west end draws visitors into its depths.



SOUTH BANK SHOW

Fitted into the shell of Giles Gilbert Scott's heroic Bankside Power Station, the Tate Gallery has an impressive new home for part of its collection that will act as a wider stimulus for artistic creativity and urban regeneration.

The conversion of Bankside Power Station in Southwark to house part of the Tate Gallery's collection of modern art represents the reinvention of a national institution as well as the regeneration of an industrial monument and its surroundings. The Tate Gallery holds one of the three or four most significant collections of twentieth-century art in the world, on a par with MoMA in New York. Each day, 20 000 people throng through its existing galleries housed in a nineteenth-century palazzo on the river Thames at Millbank. The phenomenal growth in art audiences coupled with a serious shortage of space eventually convinced the Tate that it should divide its collection into two. A new institution, Tate Modern, will contain an expanding accumulation of international twentieth-century and contemporary art, together with fluid, flexible spaces for multi-disciplinary exhibitions and performances, while the existing Millbank building will be adapted to become the national museum of British art from 1750 to the present day.

The Tate's record of architecture patronage is commendable. In recent years it has built new galleries to house its collections in Liverpool (AR July 1988) and St Ives (AR July 1993), as well as Stirling's Clore Gallery for the Turner bequest at Millbank (AR June 1987). Its decision to locate the new Tate Modern in Southwark, an impoverished London borough, might seem unorthodox, but Giles Gilbert Scott's cavernous former power station had the dual advantages of space and an outstanding riverside setting. Moreover,

the immediate area is undergoing a stealthy regeneration. During the sixteenth and seventeenth centuries, Southwark was London's bawdy pleasure district; more recently, its cheap warehouse spaces attracted colonies of artists and craftspeople. Now there is talk of a new arts quarter and Richard MacCormac's Jubilee Line station (AR May 1999) reinforces the borough's links with the rest of London.

An international competition for the new Tate was won by Herzog & de Meuron. Compared with other shortlisted designs, the Swiss practice's proposals adhered most closely to the building's original organization. There were no overtly wilful gestures, no cutting into the building or applied decoration. Instead, through a series of minimal interventions, the heroic, brooding volumes of Scott's industrial monolith are simply and rationally converted to make a variety of spaces for art. Nicholas Serota, the Tate's director sees these 'as a set of instruments which will be played in different ways by artists and curators in the years ahead'.

The most visible intervention is a two-storey 'light beam' that runs longitudinally along the building, its emphatic horizontality counterbalancing the strong vertical mass of the central chimney. This new structure brings light into galleries and is illuminated at night; its huge mass pulsating with light above the Southwark skyline evocatively signals the building's reincarnation.

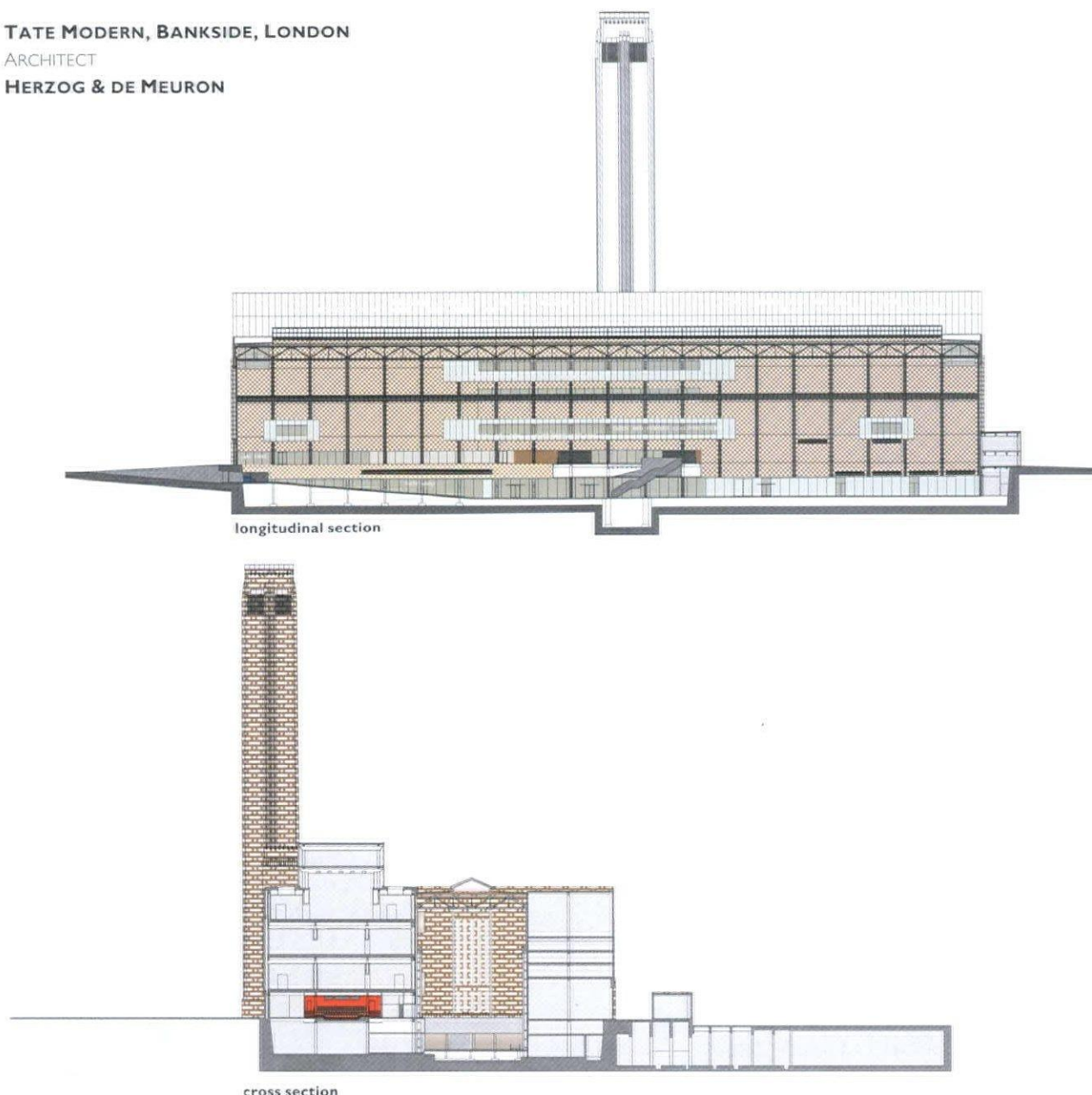
Designed in two phases between 1948 and 1963, Bankside reflects Scott's interest in the early Dutch Modernism, manifest in a taut brick



TATE MODERN, BANKSIDE, LONDON

ARCHITECT

HERZOG & DE MEURON



skin incised with long vertical openings. Herzog & de Meuron leave this largely intact, but gently diffuse the building's necessarily hermetic character with a big ramp on the west side that funnels visitors into the soaring, cathedral-like volume of the former turbine hall. Now carved open to its full height, this forms an imposing public street for performances and displays of art, particularly large sculptures and installations. Public facilities, such as education rooms, shops and information spaces are arranged around the turbine hall, which acts as a constant reference point for visitors as they circulate through the new museum.

Despite variations in size, configuration and lighting conditions, the gallery spaces constitute a recognizable overall family. This partly stems from an early decision to maintain a minimum room height of around 5m, rather than creating a hierarchy of floors, which lends itself to stratification by medium or school. On the north side of the turbine hall, three floors of galleries are organized around a central concourse. Multiple entrances to groups of rooms enable visitors to construct their own routes through the building. Gallery walls are generally plain white, with floors of either timber or concrete. Some spaces are lit from the side through Scott's existing slot-like windows, others from above through clerestoreys. Some rooms are totally enclosed, others have bracing views out over the Thames or back into the turbine hall.

In the longer term, the strip on the south side of the hall (in use as a

switch house, since Bankside still functions as electricity sub-station) will be converted to create additional gallery spaces. These will be of a rougher, more mutable character than the galleries on the north side, for experimental exhibitions, performances and collaborations between different artistic disciplines. Reflecting the changing nature of art museums, Herzog & de Meuron's finely considered architecture serves as a stimulus to creativity rather than a static constraint. Clearly the new Tate is an important, complex organism and once the art is installed in May, we shall return to it in greater detail.

Architect

Herzog & de Meuron, Basel

Project team

Jacques Herzog, Pierre de Meuron, Harry Guggler, Christine Binswanger, Michael Casey, Thomas Baldauf, Ed Burton, Victoria Castro, Emanuel Christ, Peter Cookson, Adam Firth, Nick Graber, Irina Davidovici, Liam Dewar, Catherine Fierens, Mathias Gnehm, José Ojeda Martos, Filipa Mourao

Associate architect

Sheppard Robson

Structural and mechanical engineer

Ove Arup & Partners

Landscape architect

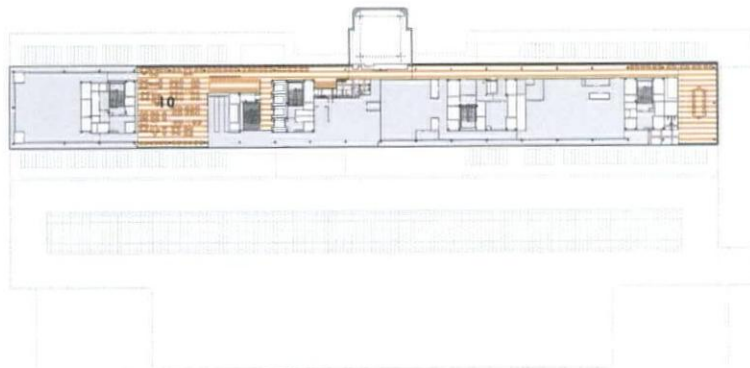
Kienast Vogt Partner

Photographs

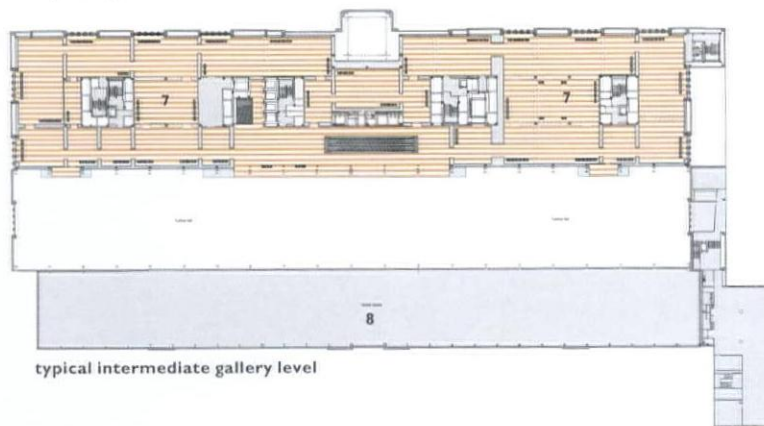
Marcus Leith

Millennium Commission grant £50 000 000

Total project cost £134 000 000



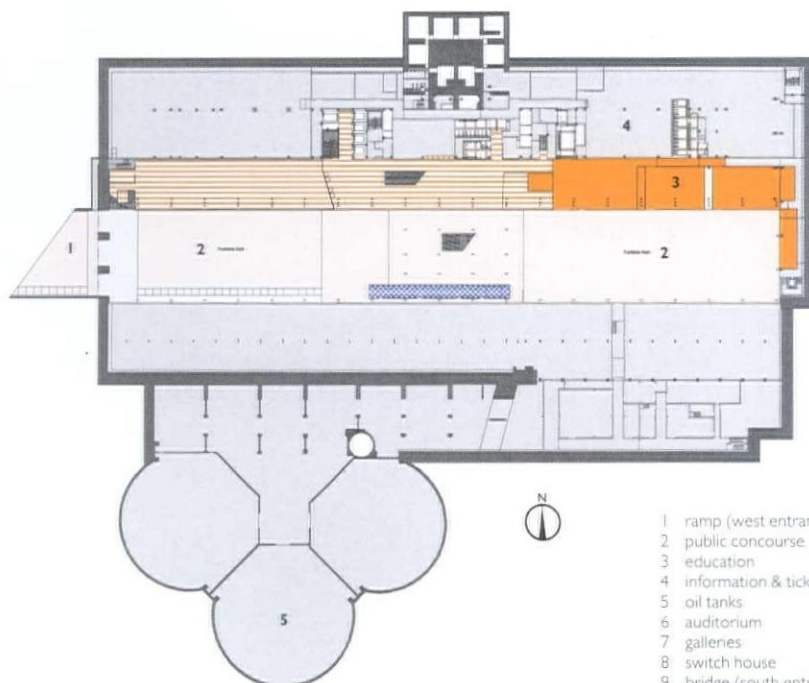
top floor plan



typical intermediate gallery level



ground floor plan



lower ground floor plan (scale approx 1:1250)

- 1 ramp (west entrance)
- 2 public concourse
- 3 education
- 4 information & tickets
- 5 oil tanks
- 6 auditorium
- 7 galleries
- 8 switch house
- 9 bridge (south entrance)
- 10 restaurant



3



4

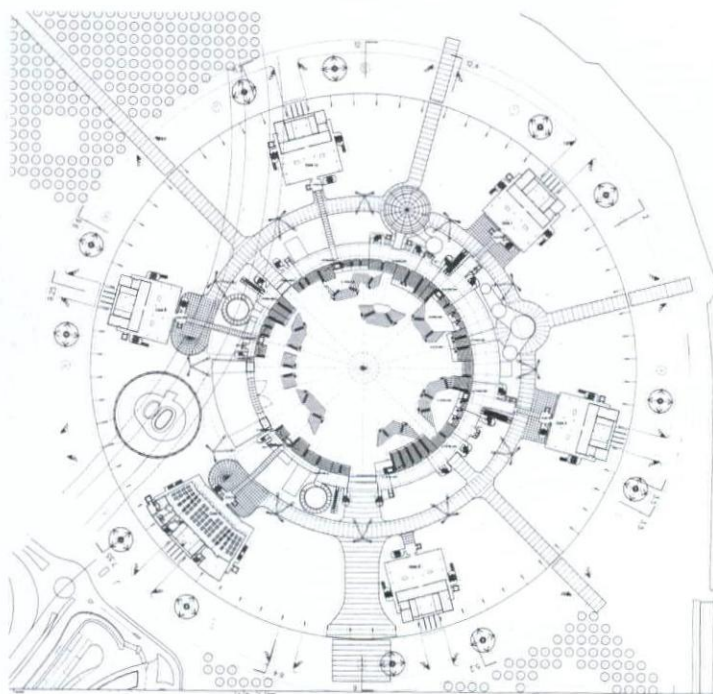


5

3 The turbine hall is transformed into a huge public street, which will be animated by changing displays and installations.

4 Galleries are tall, austere spaces with plain white walls and either timber or concrete floors. Supplementing artificial illumination, natural light is diffused through Scott's original window slots and from clerestoreys.

5 The simple galleries will form a neutral backdrop for the art, which is in the process of being installed.



first floor plan showing core buildings and infrastructure (scale approx 1:4500)

MAGIC BUBBLE

A triumph of engineering ingenuity, the Millennium Dome is the largest setpiece project of the UK's millennial programme. It forms a new landmark on the river and will have a life after its various internal exhibitions and shows come to an end.

Hovering like a gargantuan blancmange above the Greenwich Peninsula, the Millennium Dome is now an inescapable part of the London skyline. The focus of British millennium celebrations and the largest single project in both scale and funding, the Dome also forms the nucleus of an ambitious regeneration project for south-east London. The Greenwich Peninsula was chosen over a site in Birmingham because of its symbolic associations (it is clipped by the prime meridian) and because the area was in dire need of reconstruction and the millennium programme provided an opportune catalyst. Formerly a bleak polluted tract of industrial

wasteland, the peninsula is to be regenerated through a new neighbourhood grafted along its eastern edge and improved transport links. Dome and peninsula are served by Will Alsop's North Greenwich station (AR May 1999), which connects the area with the rest of London.

Dominating the flat peninsular plain, the Dome's sheer scale is awesome. Nelson's Column could stand comfortably within its cavernous 50m high interior. Engineered by Buro Happold, it is the world's largest membrane structure. Twelve 100m high steel lattice masts painted in Rogers' signature yellow support an intricate tensioned net of steel cables. A 30m diameter cable ring

restrains the centre of the cable net and around the perimeter, a compression ring beam and vertical ground anchors resist huge tension forces. The central portion of the roof has mechanically opening vents to allow natural ventilation. The hemispherical structure is clad in 80 000 sqm of Teflon coated glass-fibre panels. The smooth fabric surface is alternately hermetically opaque during the day and eerily translucent after dark; at night the entire structure glows and pulsates like a giant jellyfish. Dotted round the perimeter, pods encased in slatted cylindrical cages house assorted mechanical and service equipment.

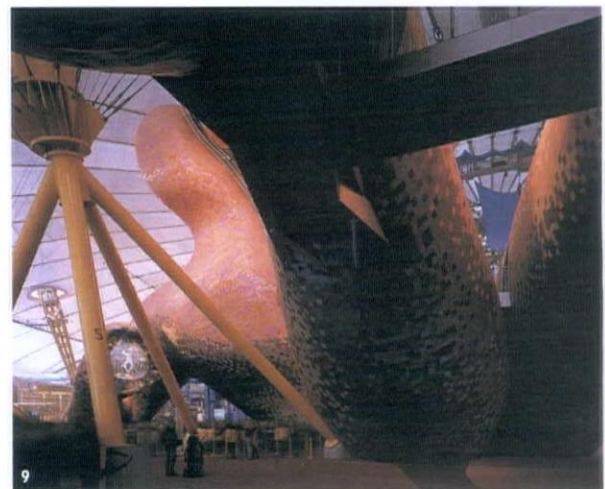
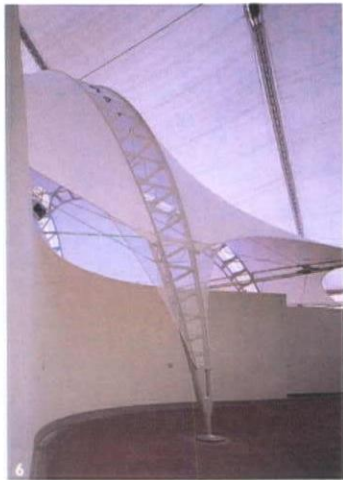
- 1 Poised at the tip of the Greenwich Peninsula, the Dome is a conspicuous addition to London's riverside skyline. Its vast scale dwarfs its surroundings.
- 2 Steel lattice masts 100m high support the huge tent-like roof.
- 3 Tensile canopies protect the entrance.
- 4 The central arena for daily performances, a millennial Big Top.
- 5 The soaring structure and its intricate network of steel cables does have an undeniable drama.



MILLENNIUM DOME

ARCHITECT

RICHARD ROGERS PARTNERSHIP



In form and content, the Dome has an obvious precedent in Ralph Tubbs' Dome of Discovery, which introduced assorted marvels of the emerging technological age to a grateful nation during the 1951 Festival of Britain. Nearly half a century later, the Millennium Dome is essentially another mammoth marquee on the edge of the Thames, filled with a slightly eccentric jumble of stalls in the persistent tradition of the English village fete. Fourteen corporate-sponsored exhibition zones are arranged around an arena in which dancers and acrobats stage elaborate daily performances, choreographed

by Mark Fisher. Zones are structured around various themes, including religion, the environment, human biology and the mechanics of commerce. Despite protracted controversy over the exact nature of the Dome's contents, there was an attempt at imaginative architectural commissioning, which has given rise to some intriguing tableaux.

The most popular and conspicuous exhibit is the Body Zone, designed by Doug Branson and Nigel Coates. Clad in iridescent blue, pink and yellow plastic tiles, a humanoid colossus (like a mutant Henry Moore sculpture) towers over

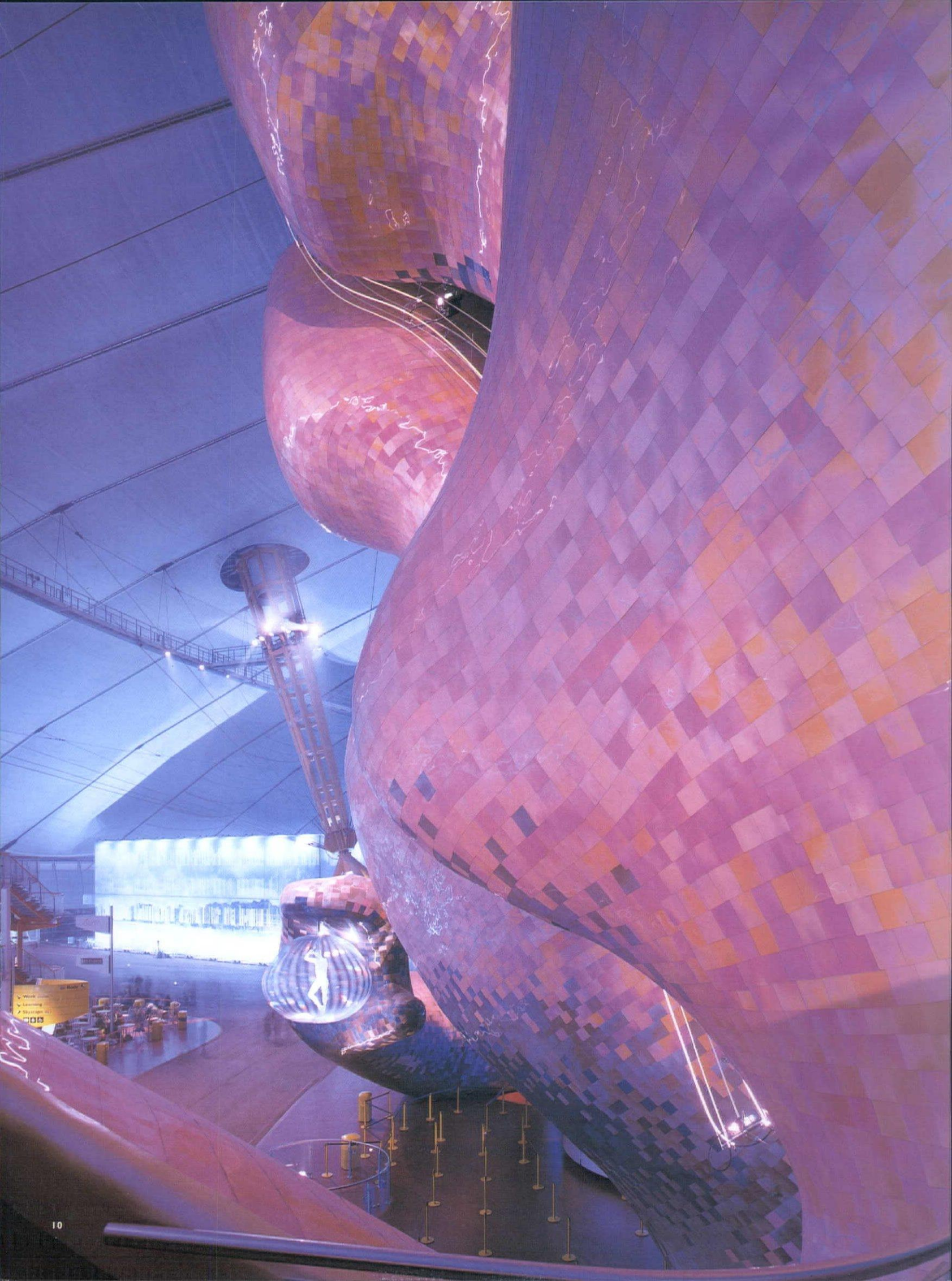
the scrum of visitors. Inside, a complex labyrinth of tunnels approximates a journey through the human body. Eva Jiricna's Faith Zone is a cluster of arched tensile canopies stretched out over sinuous walls. Executed with characteristic refinement and precision, the simple white spaces are a tranquil refuge from the at times overwhelming mêlée of things constantly competing for attention.

Shared Ground by Japanese architect Shigeru Ban (collaborating with Rogers' alumni Philip Gumuchdjian and Stephen Spence) takes Ban's inventive exploration of cardboard structures to new

6, 7
A cluster of arched tensile canopies reaches out to embrace visitors to the Faith Zone, by Eva Jiricna. The cool white spaces provide a calm respite amid the scrum of distractions.

8, 9
Nigel Coates' mutant humanoid forms for the Body Zone are one of the more striking exhibits.

10
The structure is clad in iridescent tiles, creating a lusciously shimmering, polychromatic surface.



MILLENNIUM DOME
ARCHITECT
RICHARD ROGERS PARTNERSHIP



- 11
Juxtaposition of Dome structure and
Zaha Hadid's Mind Zone.
12
Sleek folded planes and surfaces create
a dynamic composition.
13
Backlit translucent glass-fibre panels
generate a seductively glowing surface.
14, 15
Hadid's sophisticated scenography.

heights (AR September 1996). Here he has designed a large spiral pavilion for an exhibition exploring the relationship between space and community, fabricated from cardboard columns, mullions, louvres and panels. A steel deck and steel ring beam provide additional stability. The raw material for the project was collected by schoolchildren and recycled into various constructional elements.

The Mind Zone by Zaha Hadid is a dynamic composition of fashionably folding planes and surfaces clad in lightweight glass-fibre panels. Lit from behind, the panels glow with a soft sky-blue luminance in the manner of

Japanese *shoji* screens. Visitors process through the spaces on a linear circuit, but unlike other areas, Hadid was able to exercise some control over the Mind Zone's content, commissioning young artists to produce a series of installations that reflect the richness of human thought processes.

At the end of this year, the carnival attractions will be folded away, the exhibition spaces dismantled and a new use found for the Dome structure, which has a potential lifespan of at least 25 years. Proposals currently under consideration include a convention hall, sports complex and shopping centre.

More fascinating are the possibilities raised by applying the Dome's tensile roof technology to enclose huge areas of inhospitable land in extreme climates. Buckminster-Fuller's fantasy of a city enclosed in a transparent bubble may yet not be too far distant.

Architect

Richard Rogers Partnership

Structural and services engineer

Buro Happold

Landscape architect

Bernard Ede

Photographs

All photographs by Christian Richters except
1, Peter Cook/VIEW; 2, Philip Bier/VIEW

Millennium Commission grant £509 000 000

Total project cost £758 000 000

(including running costs for one year)





UNDER ARTHUR'S SEAT

The Athens of the North has acquired a major new building which is intended to extend the city's major industry, education, while reflecting on ancient Scottish myth, landscape and tradition.

Edinburgh's historic romance derives from an extraordinary site and a townscape, from 'the most predictable to the most improbable and spectacular, and often both at once'.¹ Surrounded on all sides except the north by rugged hills, the place offers the juxtaposition of magnificent intractable nature and the man-made.

The popular image of Edinburgh, depicted by seventeenth- and eighteenth-century engravers, is the Royal Mile – the medieval backbone of the Old Town that descends from west to east, from the castle at its head to the Palace of Holyrood House at its foot. Until now most visitors to the city have been principally drawn to the upper section, to the Castle, its environs and to the High Street. But at the other end, beyond the Canongate, the palace was isolated by slums and urban dereliction.

The Holyrood Project was conceived in the late '80s as an urban renewal scheme, funded by various means and designed to regenerate 10 acres of derelict land in Canongate – and thereby correct the

imbalance of the Royal Mile. Divided into three main sites on either side of Holyrood Road (which runs parallel to the Royal Mile), part of the scheme has provided new housing by architects including van Heyningen & Haward and Richard Murphy, and intelligent amenities such as the Poetry Library by Malcolm Fraser. But the scheme's lynchpin is a new public attraction – the Dynamic Earth exhibition, housed in the festive William Younger Centre by Michael Hopkins & Partners, and built on an old brewery site to the south of Holyrood Road.

Across the road, next to the palace, is the site of Enric Miralles' Scottish Parliament building. At present a hole in the ground, it will constitute another popular magnet and, while not part of the Holyrood Project, it probably owes its presence in this part of the city to the project's civilizing effects.

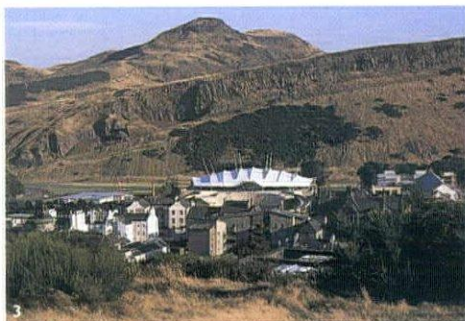
The geological theme, informing the centre's exhibition and the building's design, celebrates the memory of James Hutton, an eighteenth-century pioneer of modern geology who lived and worked on the same

spot. There are three distinct parts to the building, the most visible being an articulated tented superstructure of taut fabric (PTFE) and cables and bristling masts. Beneath are a two-storeyed building containing the exhibition, offices and workshops, and a monumental stone theatre with tiered seating in the ancient tradition.

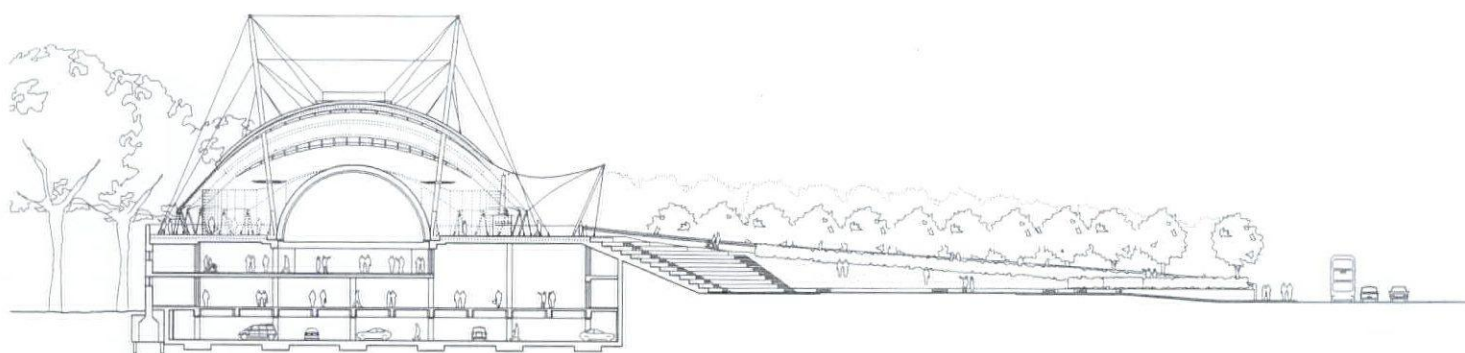
The tented canopy, running east-west with the axis of the Royal Mile, is plainly a descendant of the amenity building at the Inland Revenue centre at Nottingham (AR May 1995), and the Mound Stand at Lord's Cricket Ground, London (AR September 1987). Counterpoised to the dark mass of landscape, to the city's weightiness and gravity, the structure has an exotic insectival appearance. As a demonstration of tension between artifice and nature (a Hopkins' preoccupation), it seems complete.

It shelters a luminous billowing pavilion which, enclosed by sheer glass walls, provides entrance to the exhibition, a civilized meeting place and an elegant café. It is an exhilarating space. Luminance is

**DYNAMIC EARTH CENTRE, EDINBURGH,
SCOTLAND**
ARCHITECT
MICHAEL HOPKINS & PARTNERS



- 1
Luminous and delicate before the
awesome Salisbury Crags ...
2
... which is the westernmost outcrop of
the huge volcanic eruption which is
dominated by the peak of Arthur's Seat.



cross section

2



DYNAMIC EARTH CENTRE, EDINBURGH, SCOTLAND

ARCHITECT

MICHAEL HOPKINS & PARTNERS



site plan

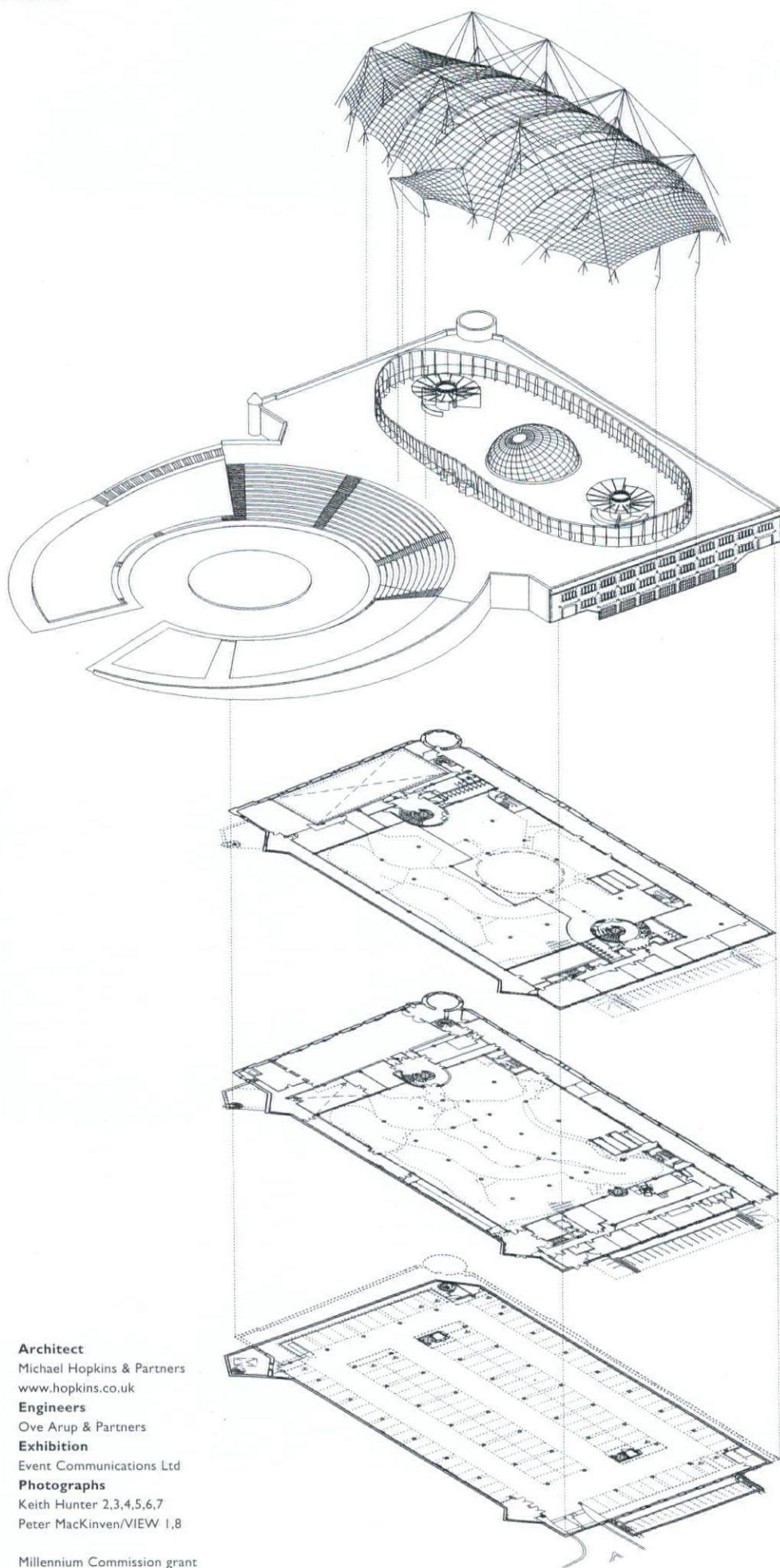
- 3 A tensile building ...
- 4 ... giving on to a stone theatre – reminder of Edinburgh's heroic Neo-Classical past.
- 5 Tent tops nineteenth-century Gothic remains, and ...
- 6 ... delicately makes an arcade round body of building.
- 7 Dome of theatre bursts through floor.
- 8 Café overlooks crag and the huge park in a contrast of artefact and nature.

intensified by skylights, slivers of glass fixed to ladder trusses lifted above and separating the fabric panels of the great roof. Bursting through the centre of the floor is the hemispherical dome of the theatre below. Latitude and longitude are marked asymmetrically across its surface to give the appearance of a tilted globe, and this asymmetry working with the angled columns gives its eruption greater force.

If the canopy appears to float, the plinth on which it rests suggests an opposing weightiness. The exhibition space is a black box with offices and workshops on either side. Externally it is partly contained by an old stone wall, a nineteenth-century Tudor Gothic remnant of the old brewery, which has been restored and extended by loadbearing sandstone additions.

The third component of the centre, the monumental amphitheatre, contributes to Edinburgh's tradition of civic design. As well as proving a grand entrance and turning point for tourist buses, it will be used for outdoor performances during the annual Edinburgh Festival. Other references manifest themselves for from this quiet evocation of ancient Greece, you can sit on blocks of hewn sandstone and look across at the other evocations of Classical antiquity on Calton Hill built in Edinburgh's heroic period. P. M.

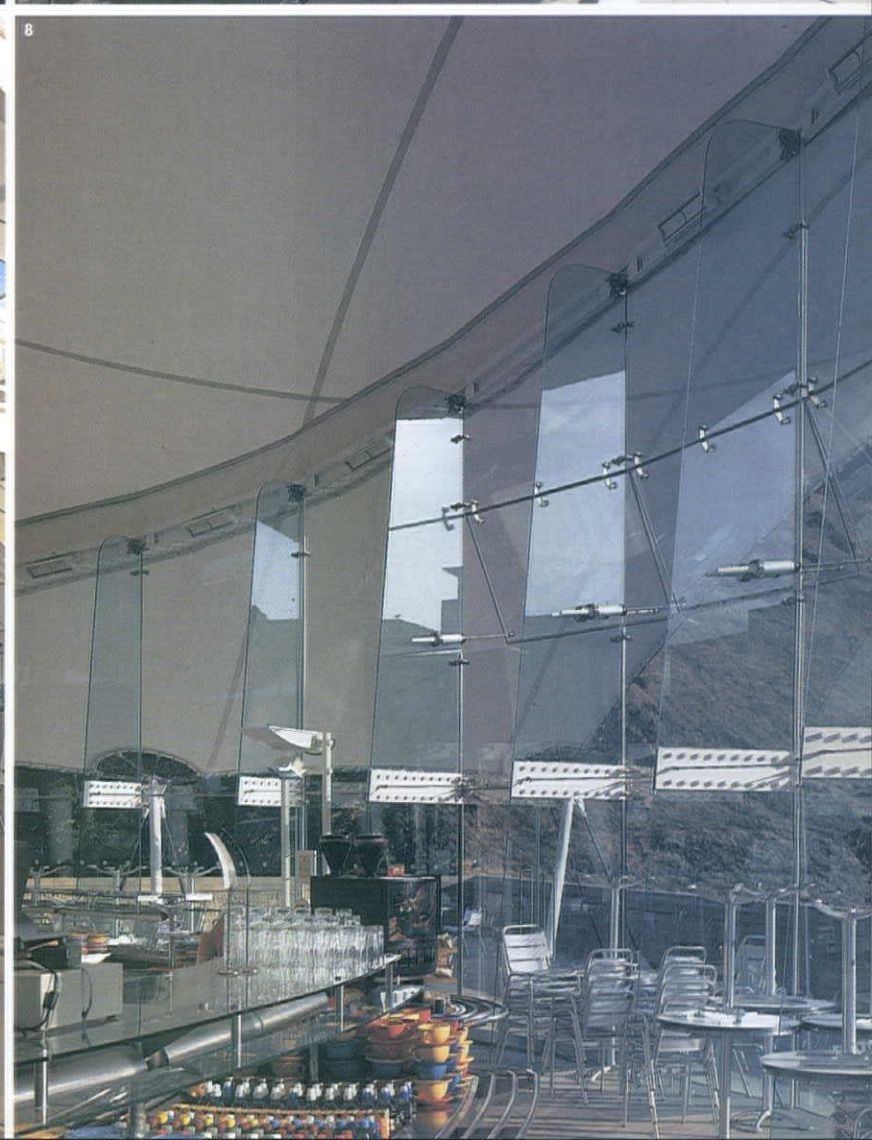
Edinburgh: The Buildings of Scotland, Penguin. Editor: Colin McWilliam.



Architect
Michael Hopkins & Partners
www.hopkins.co.uk
Engineers
Ove Arup & Partners
Exhibition
Event Communications Ltd
Photographs
Keith Hunter 2,3,4,5,6,7
Peter MacKinven/VIEW 1,8

Millennium Commission grant
£15 815 000
Total project cost £35 685 000

projected axonometric plans

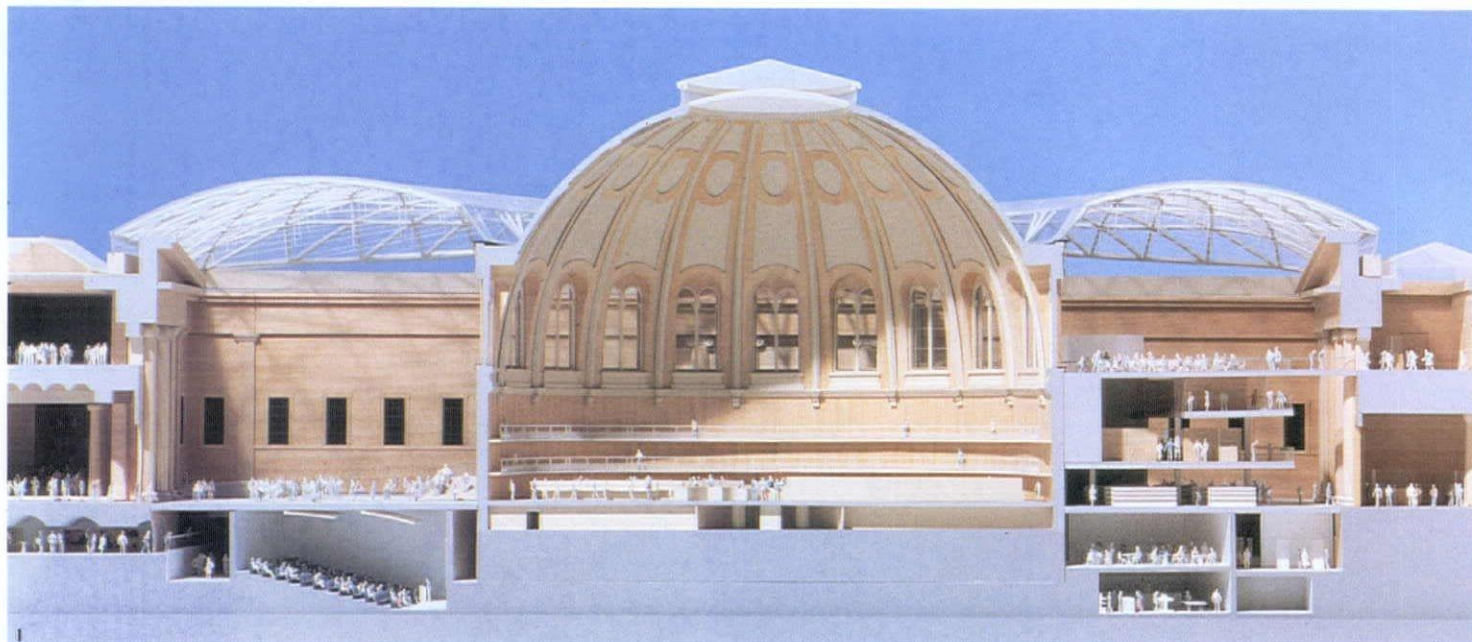


BRITISH MUSEUM GREAT COURT, LONDON

ARCHITECT

FOSTER AND PARTNERS

- 1 South-north sectional model with new balconies north of Sydney Smirke's drum.
- 2 Restaurant balcony north of drum.
- 3 Robert Smirke's Great Court elevations are being restored, and Sydney's drum is being given a stone overcoat.
- 4 From south (main entrance axis).
- 5 Reading room to be restored and re-used.



GREAT COURT

When the national library moved out of the British Museum many felt alarmed. In fact, the move has made possible rejuvenation of the Matron of Museum Street, which will make the much-loved building more welcoming.

Robert Smirke's British Museum, built neo-Greek between 1823 and 1852, was the first public museum in Europe. It is the second most popular attraction in Britain (after Blackpool Pleasure Beach) and has become the most visited museum of its kind in the world.

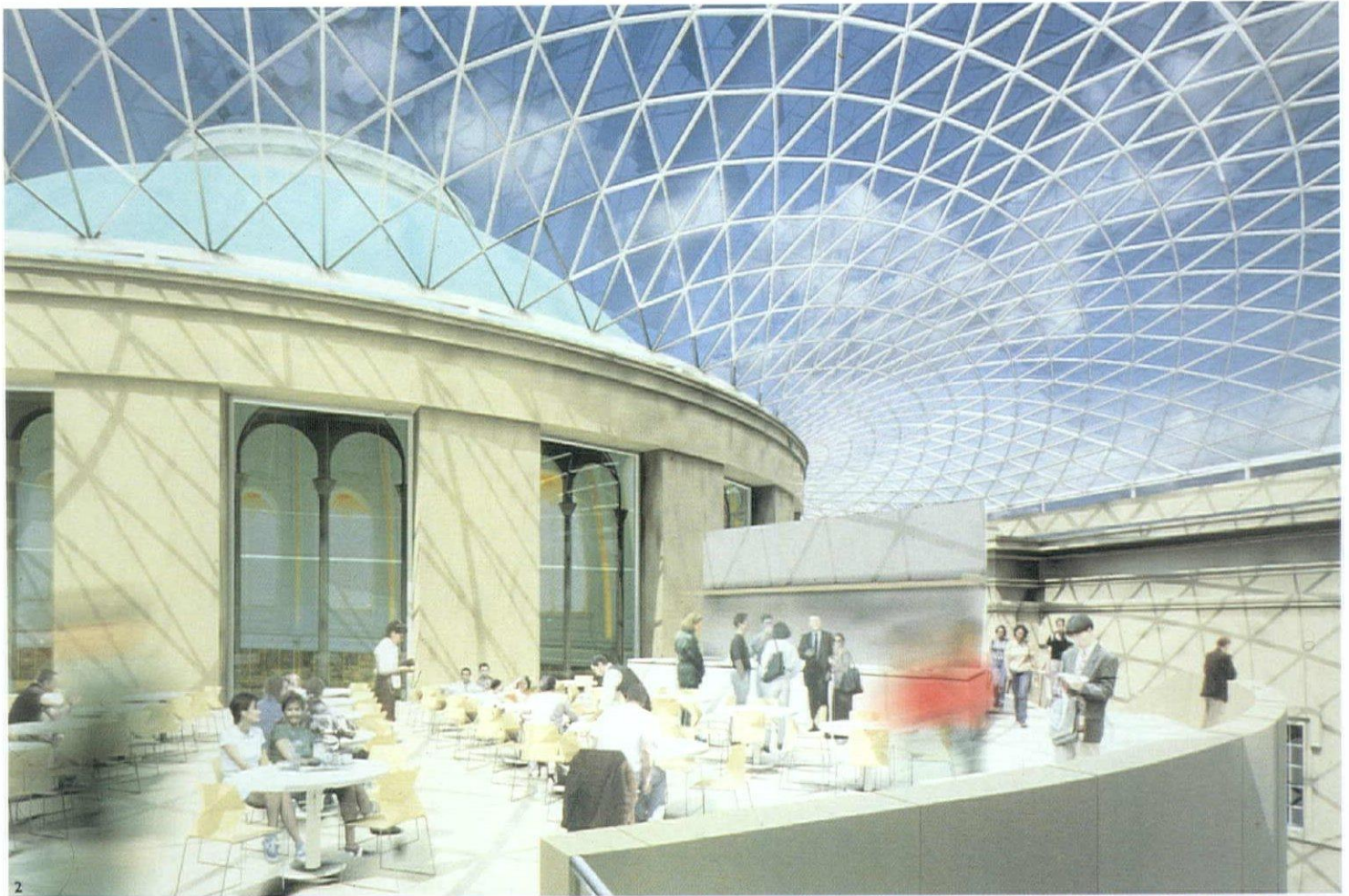
Smirke's original design was simple: a two-room deep front range behind the famous portico led to one-room deep ranges which enclosed a noble central courtyard. But as the collections and roles of the museum grew, the plan was radically altered – most dramatically by Robert Smirke's brother Sydney who took over as architect and started to build the circular reading room in the Great Court only a couple of years after the main building was finished. Thrusting a circular peg into a rectangular hole left uneasy triangular spaces in the corners of the orthogonal space, but these were used by the staff (and worked quite well) for book storage.

Removal of the national library to new premises (AR June 1998), allowed the museum's whole strategy to be rethought. For a building that has sometimes to accommodate nearly as many visitors as Heathrow, the world's busiest airport, arrival and reception facilities were woefully inadequate. After an open selection process, Sir Norman Foster & Partners were appointed as consultant architects

for reorganizing the museum and revitalizing the Great Court.

Their final proposal, which is now being built, was as seemingly simple as it was bold. A glass roof will link the rectangle to the circle: the Great Court will be re-evoked as a fine public space. All the corner bookstacks will be removed and the drum of the reading room will become a free-standing object. The Court will become part of the museum's arrival sequence which will become spacious enough to cater for the crowds. Circulation across the middle of the plan, previously blocked by the library, will be freed; long and tedious journeys round the perimeter will be obviated.

At a stroke, the place will be transformed. But there were great difficulties in achieving simplicity. For instance, the lightweight roof had to span from the rectangle to the circle with no intermediate supports; the circle was not exactly central within the rectangle. The structure, evolved with Buro Happold, is a triangulated toroid, designed to bear vertically on Robert Smirke's walls round the court, and its loads are taken by composite steel and concrete columns round Sydney's drum concealed behind new stone cladding. Climate control (also designed with Happolds) is equally ingenious, using a combination of natural and mechanical ventilation, radiant and



convective cooling to achieve gallery conditions with minimal use of artificially generated energy.

New elements were tricky to design and build, but the old fabric had to be enhanced as well. Robert Smirke's Portland stone elevations and his four *in antis* Ionic porticos are being restored (north and south ones had been radically altered). Sydney's brick drum, which was never intended to be seen from the outside, is being given a Portland stone skin. The reading room is being restored to Sydney's colour scheme, and a new reference collection (given by Paul Hamlyn) is to be installed in its lower levels so that you will still be able to use desks frequented by Marx, Gandhi, Sun Yat Sen and Kipling.

To the north, two elliptical platforms are being created round the drum; these will provide space for shops, temporary exhibitions and a restaurant. Removal of the British Library has allowed large amounts of space in Robert Smirke's building to be released, particularly in the north range, and these will permit the return of the ethnography collections which have been outhoused in the Museum of Mankind for 30 years. An education centre will be created under the courtyard, and many other improvements are intended to enable the Matron of Museum Street to welcome twenty-first century visitors with the generosity she offered to their nineteenth-century predecessors.

BRITISH MUSEUM GREAT COURT, LONDON

ARCHITECT

FOSTER AND PARTNERS

Architect

Foster and Partners, London
www.fosterandpartners.com

Design team

Norman Foster, Spencer de Grey, Giles Robinson,
Michael Jones, Julia Abell, William Castagna,
Mark Costello, Daniel Goldberg, Nesa Marojevic,
Peter Matcham, Filo Russo, Peter Vandendries,
Oliver Wong, Diane Ziegler

Structural, mechanical and electrical engineer

Buro Happold

Acoustics

Sandy Brown Associates

Lighting design

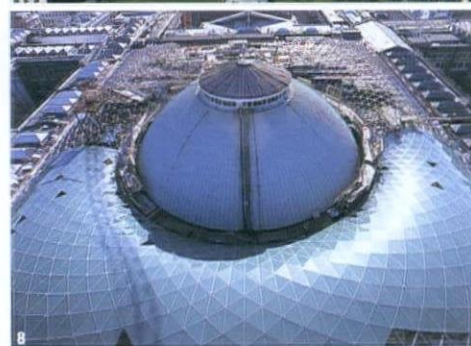
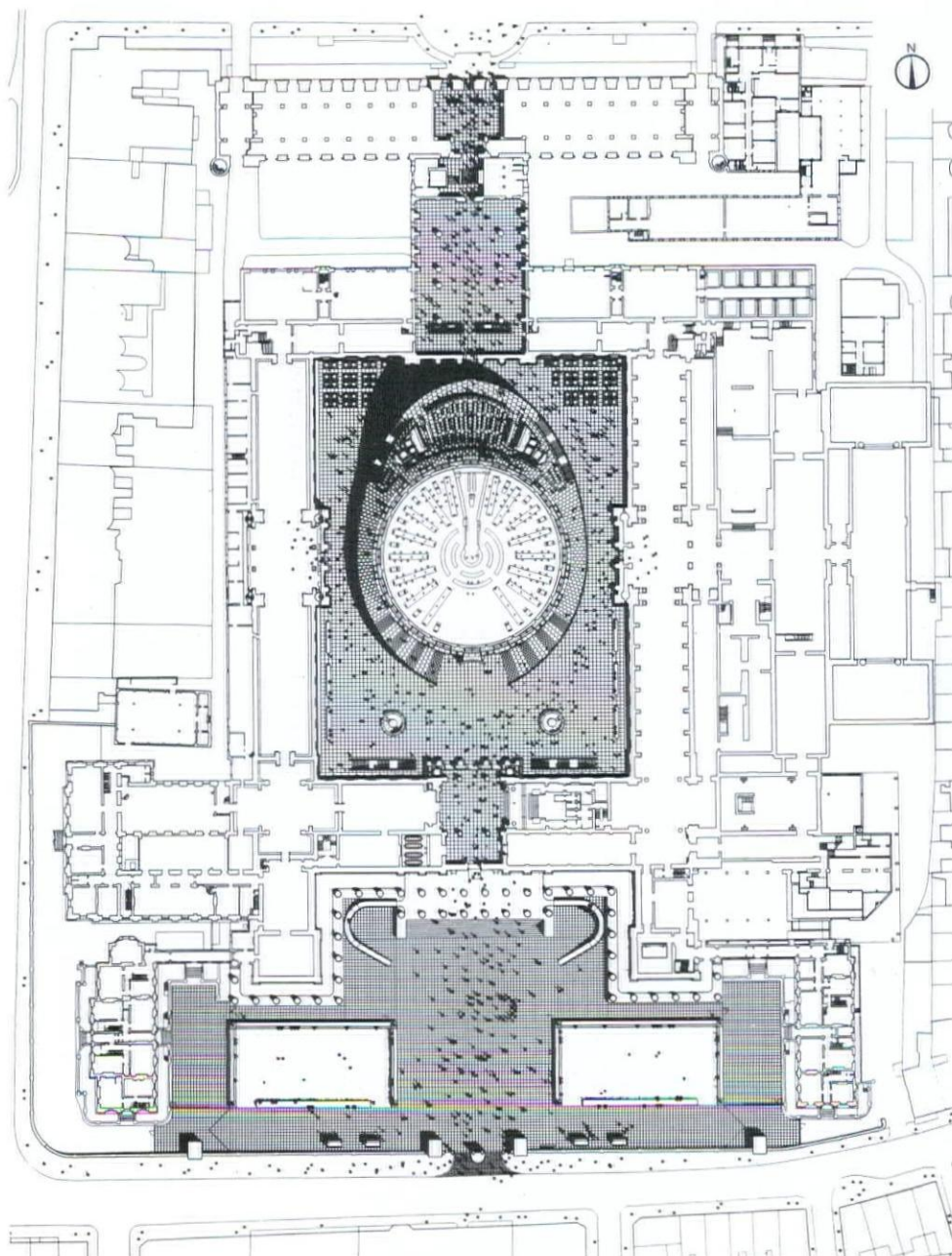
Claude Engle

Facade engineering

Emmer Pfenninger Partner AG

Millennium Commission grant £30 000 000

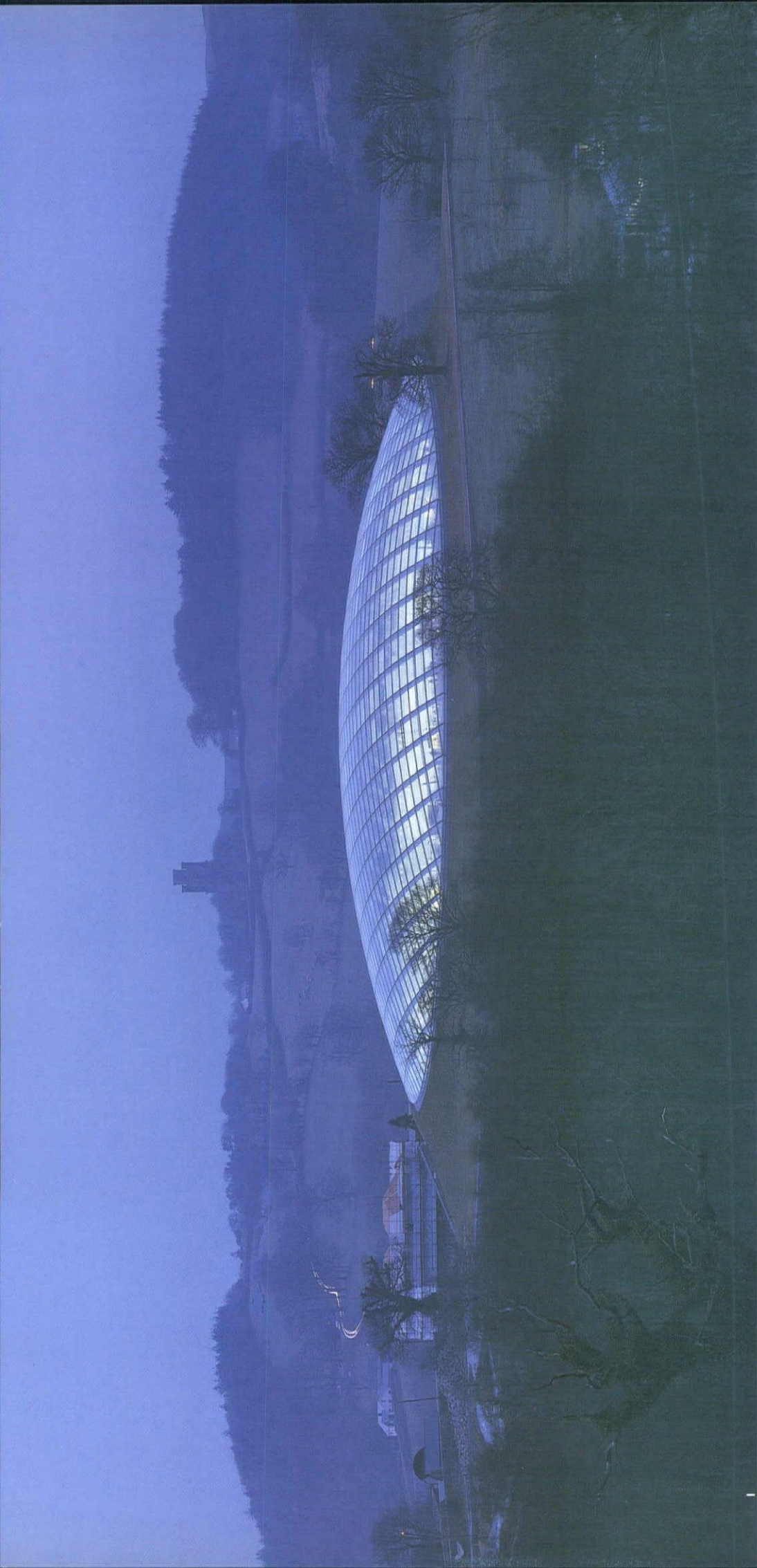
Total project cost £97 901 000



6 Great Court with toroidal glass roof off ...

7 ... and on ...

8 ... and under construction.



WELSH MYTHS

In the middle of a landscaped garden magically restored from sleep, a strange and fabulous creature has emerged as one of the wonders of Wales.

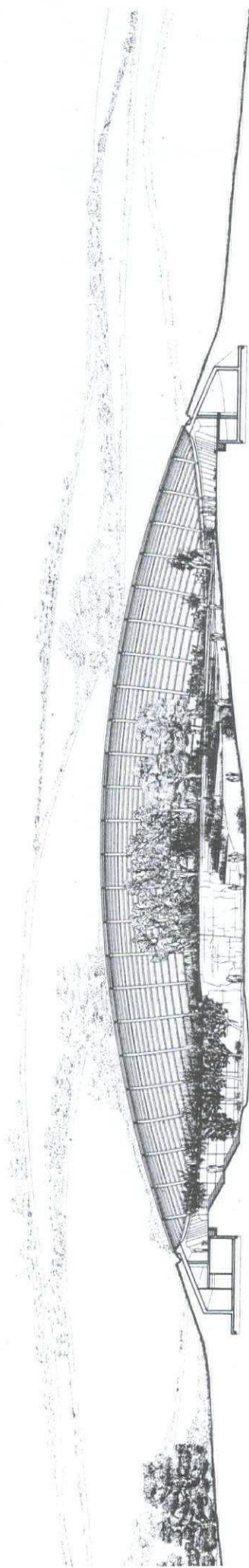
NATIONAL BOTANIC GARDEN OF WALES,
LLANARTHNE, CARMARTHENSHIRE, WALES
ARCHITECT
FOSTER AND PARTNERS

The site of the National Botanic Garden of Wales is fabled. Sir William Paxton, an eighteenth-century merchant venturer, built a fine house (by Samuel Pepys Cockerell) and made a nearly 600 acre landscaped park in the gentle curves of the Taff valley near Carmarthen. In the 1930s, the house burned down, the dams of the lakes were blown up, and the whole place was allowed to fall into forgotten

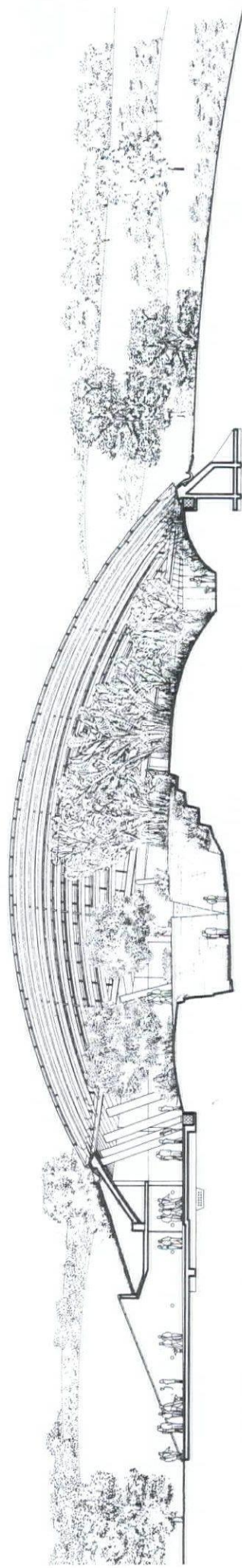
bramble-covered silence.

Seventy-five years later, the sleeping garden started to awaken under the influence of Kathryn Gustafson. Woods and lakes began to be restored, new eco-systems to demonstrate the wealth of native Welsh flora were planned, and an ambitious research programme into the flora of Mediterranean climates was set in train. Plants to be studied will come not just from

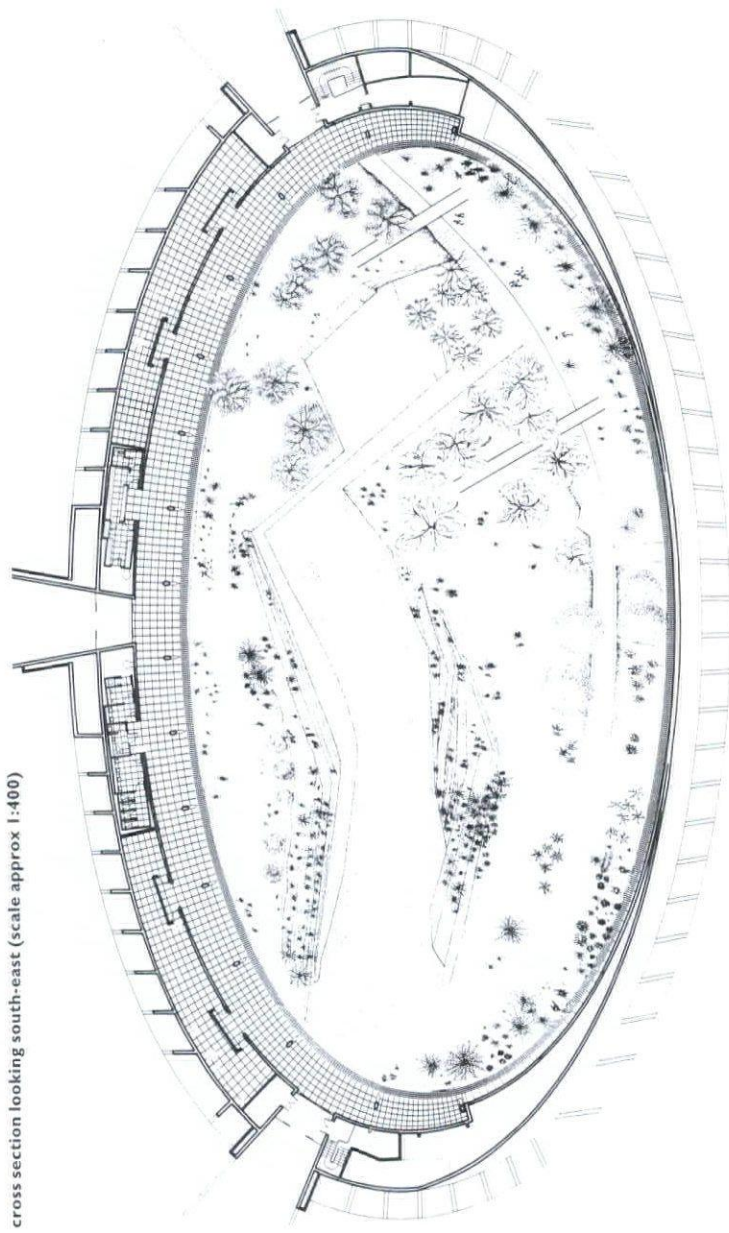
| Roof is largest unsupported glass span, relatively simply constructed on a grid of tubular steel arches.



long section looking south-west (scale approx 1:700)

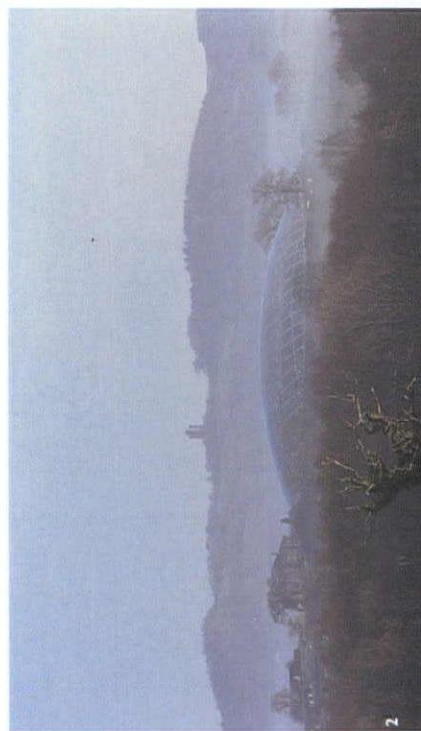


cross section looking south-east (scale approx 1:400)



ground level plan (scale approx 1:800)

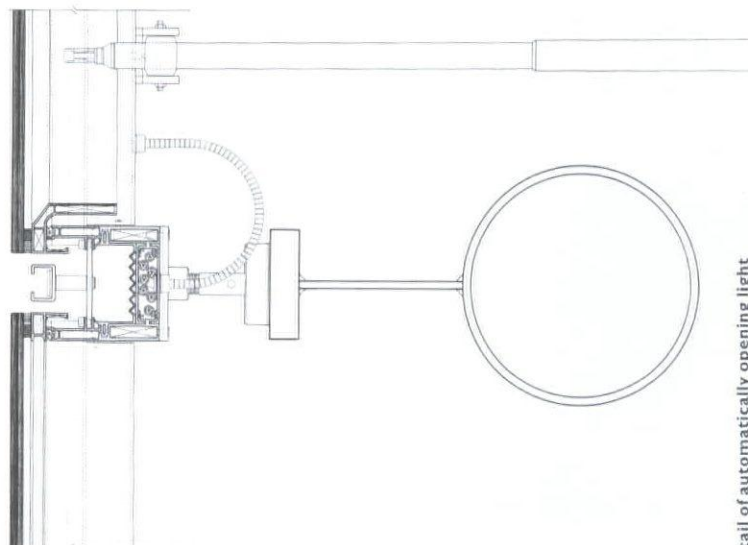
- 2 Like a mythical Arthurian beast, the Great Glasshouse rises gently from the rolling parkland.
- 3 Looking north towards colonnade.
- 4 Looking south: note opening lights at edge and apex.



**NATIONAL BOTANIC GARDEN OF WALES,
LLANARTHNE, CARMARTHENSHIRE, WALES**
ARCHITECT
FOSTER AND PARTNERS



verge detail



detail of automatically opening light

Europe but Australia, South Africa and the Americas.

Flywheel of the research project will be the Great Glasshouse, the world's largest single-span glass vault. It is an asymmetrical oval slice of toroid, tilted out of the ground towards the south to catch the sun's heat. On the northern side, a bank and concrete retaining structure protects the house from cold winds.

Structurally, the roof is simple, with tubular steel arches laid out in a regular grid. They bear on a tilted elliptical concrete ring beam and act as a ladder to which glazing is attached. A colonnade along the northern rim of the structure contains shops, exhibition galleries and cafeteria, all of which open into the huge main warmed space.

Careful control of ventilation and temperature is vital for the

delicate flora. Glass panels pivot up and down automatically to control airflow, and the house is heated by a wood-burning boiler fuelled by biomass from the site.

The Great Glasshouse will be both a place of entertainment (the Bioverse, a 'hands on learning centre') and the repository of a huge collection of living plants and fungi which form the subject of the research by scientists in buildings on other parts of the estate.

Architect

Foster and Partners, London

www.fosterandpartners.com

Landscape architects

Colvin and Mogridge

Gustafson & Porter (Great Glasshouse)

Structural engineer

Anthony Hunt Associates

Mechanical and electrical engineer

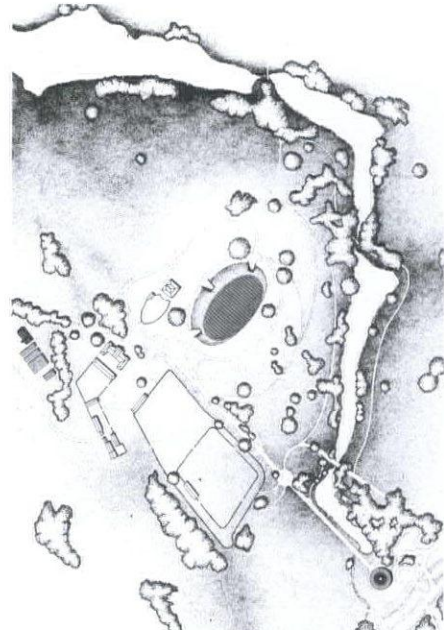
Max Fordham & Partners

Photographs

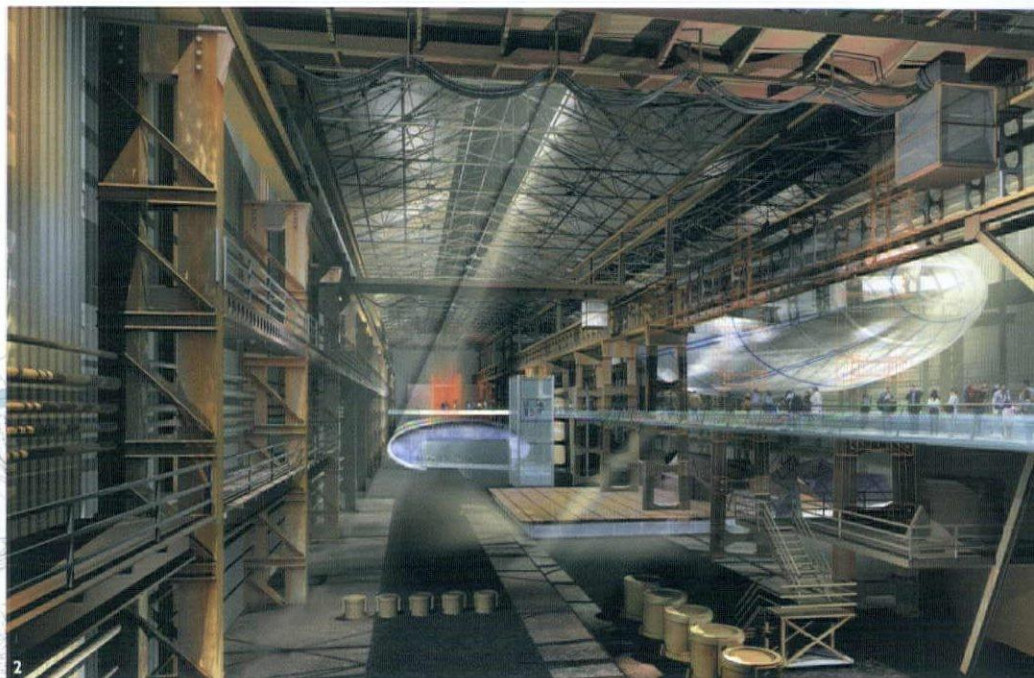
Nigel Curry, Nigel Young

Millennium Commission grant £21 700 000

Total project cost £43 286 750



site plan



MAGNA CUM LAUDE

A huge redundant steel works has become a monument to the first and second industrial revolutions, with their energy explained in metaphor.

The Templeborough Melting Shop at Rotherham was once the largest steel-making factory in the world, producing vast quantities of the metal and employing more than 10 000 people at its apogee in the 1950s. But, though the works had moved from nineteenth-century puddled steel processes to electric arc furnaces and the production of high quality special steels, technological change made the 'Anvil of South Yorkshire' redundant in the early '90s.

It is to re-open as a museum to steel production, and the two main bays, 350m long and seven storeys high, will contain four pavilions devoted to the

elements: earth, water, air and fire, with which steel is forged. WilkinsonEyre decided to allow the scale of the building to speak for itself and to let the pavilions and exhibits become events within the vast space, linked horizontally by bridges and walkways and vertically by the re-used transformer building. Great artefacts used in the original manufacturing processes are to be retained as instructive sculptures.

Arrival will be along a drive which will sweep along the River Don, the *raison d'être* of the plant in the first place. Car parking will be among the retained steel gantry crane supports of the demolished scrap metal area

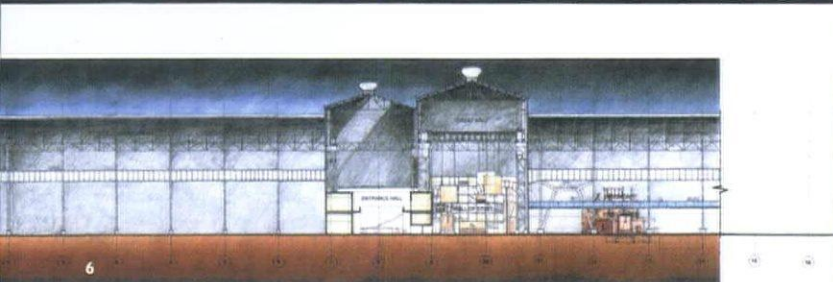
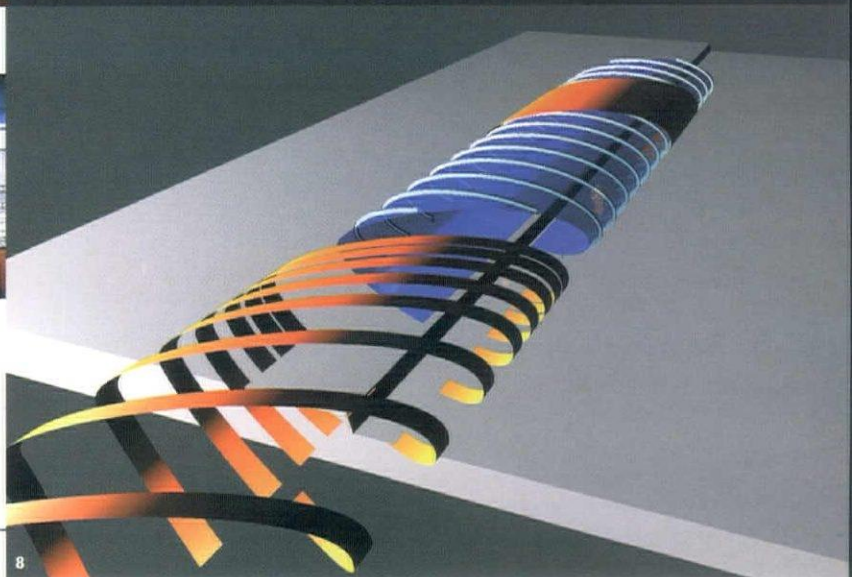
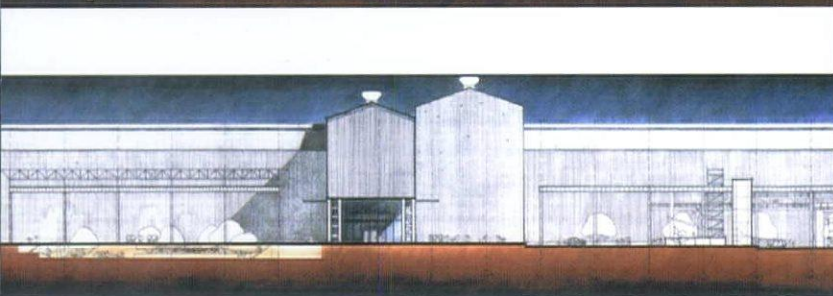
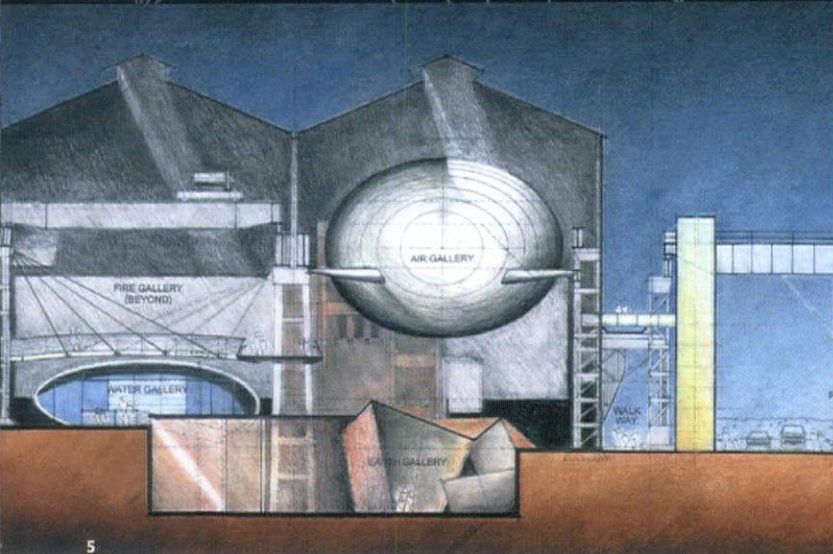
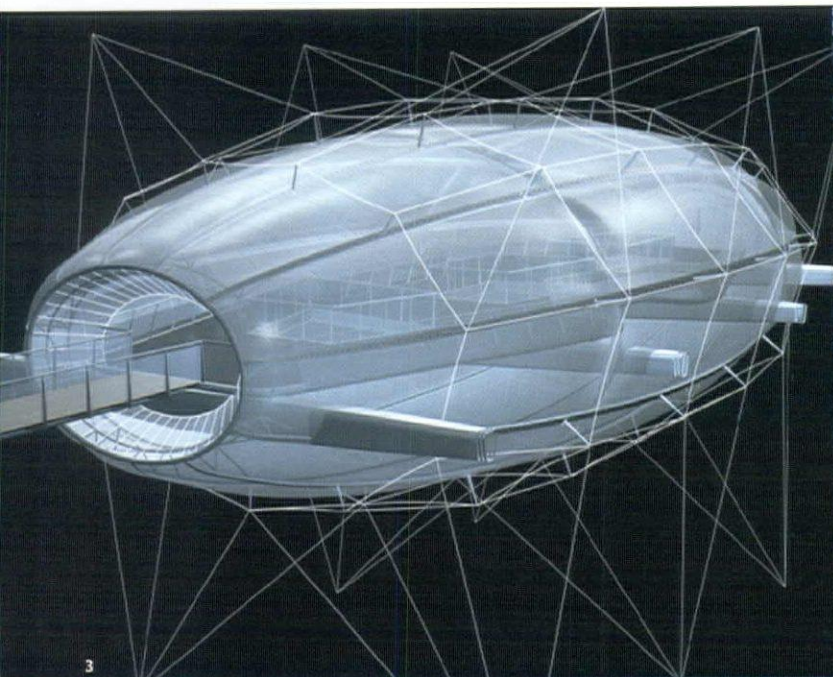
which will act as lighting masts. The north face of the retained shed will be partly replaced in metal where adjunct buildings have been demolished; the *porte cochère* entrance will be formed from the nine-storey high concaster aisles.

Inside, the individual pavilions (which were designed with Event Communications) will demonstrate different aspects of steel and its creation. Earth will be in the old basement, reached by a large platform lift; its presence will be signalled at ground level by an irregular steel floor, indicating subterranean forces. Air will look like a dirigible 12.5m above ground, where translucent foil pillows

will enclose steel platforms. Fire is to be at the western end of the huge shed, offering vistas down the whole space through mesh screens and blackened steel panels. Water will be at ground level, a stainless-steel wave with water pouring down on it from a slot in the roof. Ancillary buildings may include a hotel, and the remains of a Roman fort will certainly be preserved.

Architect
WilkinsonEyre.Architects, London
<http://www.cwal.co.uk>
Structural engineer
Bingham Cotterell
Mechanical and electrical engineers
Buro Happold, Leeds

Millennium Commission grant £18 600 000
Total project cost £37 200 000



1 Site plan.

2 Interior exhibition space (Melon Studio).

3 Air pavilion has steel floors surrounded with translucent foil pillows.

4 The great shed as it now stands.

5 Section showing relationship of galleries.

6 Long section and south elevation.

7 Part of new north elevation.

8 Diagram of spiral geometry of water pavilion.

BRISTOL NEW HEART

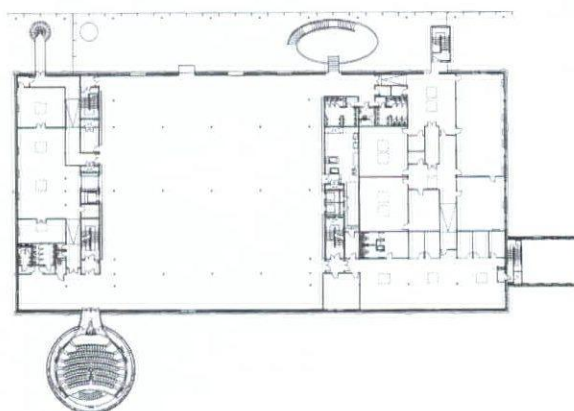
Two new and neighbouring major millennium buildings are intended to bring new life to a decayed industrial area of Bristol.

Bristol's industrial waterside area became, like many others, run down as the economy changed, but is now getting new life. One of the most powerful engines of regeneration is hoped to be at-Bristol, a Millennium project which mainly consists of two large and loosely related building complexes: Wildscreen at-Bristol by Michael Hopkins & Partners and Explore at-Bristol, by WilkinsonEyre.

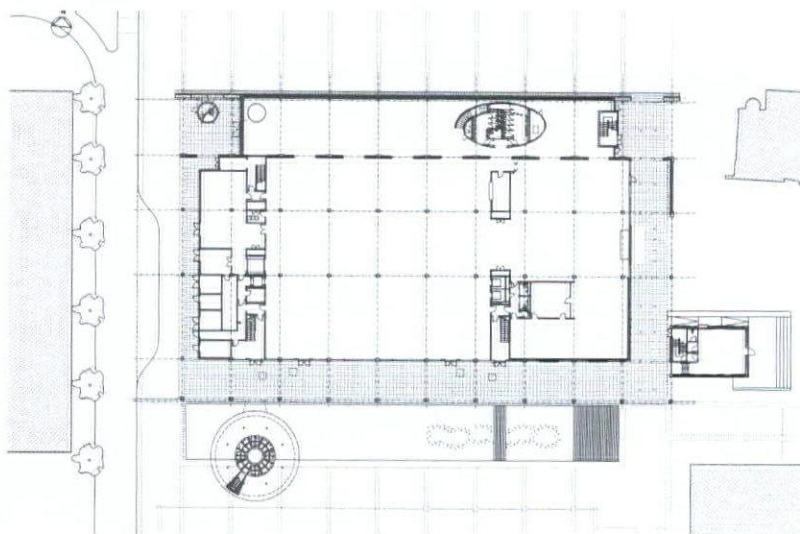
An elegant 1903 Hennebique concrete goods shed is being transformed into Explore at-Bristol. The warehouse structure with its elegant curved beams and slender columns was largely suitable for the interactive scientific displays that will make up most of the exhibits. On the south front, facing New World Square, a generous arcade is created by setting back the cladding of the ground floor. At first floor level, a bridge connects to a planetarium in a 15m diameter stainless-steel sphere sitting in a pool.

On the north front, a new gallery is provided by making a full-height transparent wall from glass, with systems which will have special lighting conditions to respond to passers-by and the seasons. At each end of the gallery is a large object. One is a stair clad in timber strips. The other is a cylinder of transparent acrylic and is full of hundreds of coloured plastic balls. These are themselves filled with eutectic salts: materials which change from solid to liquid at a fairly low temperature (actually 27degC). The latent heat of their change of state warms or cools surrounding water, through which it can be distributed to the building's local heat pumps. The balls' colour changes too, from pink to blue and back again as the eutectic process proceeds. The building itself becomes one of its own exhibits. Other temperature control devices range from using natural ventilation (where possible) to solar shading on the roof. Like many of the Millennium landmark projects, the building is intended to set an example of sustainable energy use.

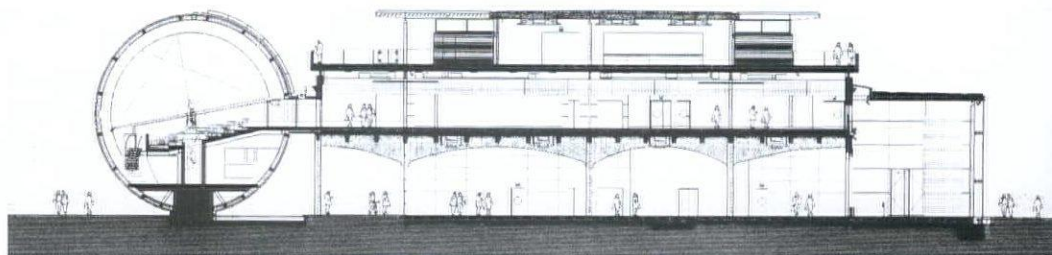
Next to the WilkinsonEyre scheme is Wildscreen at-Bristol, which is to be a celebration of the natural world that builds on the biennial Wildscreen Festival of Moving Images from the Natural World, founded in 1982. The Wildscreen building



Explore first floor



Explore ground floor (scale approx 1:1100)



Explore section

EXPLORE AT-BRISTOL

ARCHITECT

WILKINSONEYRE.ARCHITECTS

1
Aerial perspective of complex from south-west with New World Square in foreground. Left, part of Explore at-Bristol, with Wildscreen at-Bristol behind.

2
New gallery runs full length of north front.

3
South face with arcade and planetarium addressing new square.

4
An integrated part of the city: cathedral reflected in glass wall.





5
Explore: in the gallery, looking west to the cylinder filled with thermally responsive balls.

6
Explore: gallery looking east toward stair tower. Hopkins's IMAX can be glimpsed through glass, centre.

7
Explore: graceful Hennebique structure (early reinforced-concrete system) makes good exhibition spaces.

8
Wildscreen: model from south-east.



WILDScreen AT-BRISTOL, ENGLAND

ARCHITECT

MICHAEL HOPKINS & PARTNERS

forms a permanent home for the Festival and allows moving images of nature to be seen all year round, and much else too. Key elements are exhibition galleries, a tropical botanical house, an IMAX theatre and the nineteenth-century Leadworks, which is being conserved as an integral part of the complex.

The IMAX is at the northern apex of the roughly triangular site, where its imperforate masonry drum protects its interior from noise of surrounding busy traffic. At the site's southern end is the low irregular mass of the Leadworks, which is being converted into shop and café. A most original parti connects these two very disparate elements. Entrance is from the south, next to the leadworks and leading into a generous foyer, on each side of which are elements of the botanical house, the main part of which is slung over the entrance route, with ETFE foil cushion walls canted to the south behind the leadworks. Between conservatory and the drum of the IMAX is a stack of single, double and triple height exhibition spaces that make up the 'electronic zoo'; on top is a terrace which looks out south over the conservatory and Leadworks. The very diverse elements of the complex are sewn together by translucent white tents.

It is too early to see how at-Bristol will work as a new piece of city: both the main buildings are yet to be finished. But the intended mix of uses and the combination of formal urban geometry with the partly historically determined irregular relationship of the two major elements promises well.

Explore at-Bristol

Architect

WilkinsonEyre.Architects, London
www.wilkinsonseyre.com

Design team

Paul Baker, Zoe Barber, Marc Barron, Chris Brown, Stafford Critchlow, Simon Davis, Natasha Le Comber, Stewart McGill, Daniel Parker, Geoff Turner, Lindsay Urquhart, Chris Wilkinson

Structural engineer

Ove Arup & Partners

Wildscreen at-Bristol

Architect

Michael Hopkins & Partners, London
www.hopkins.co.uk

Structural and services engineer

Buro Happold

Acoustic consultant

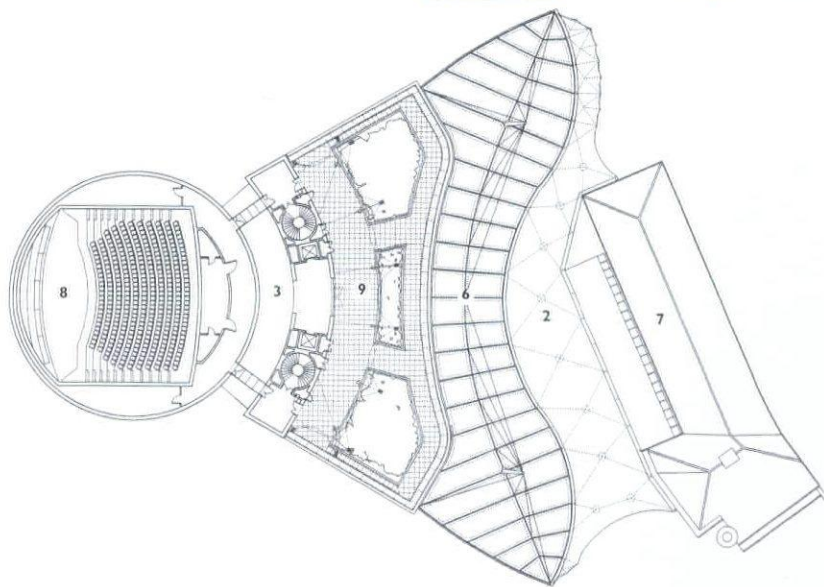
Sandy Brown Associates

Photographs

Dennis Gilbert/VIEW

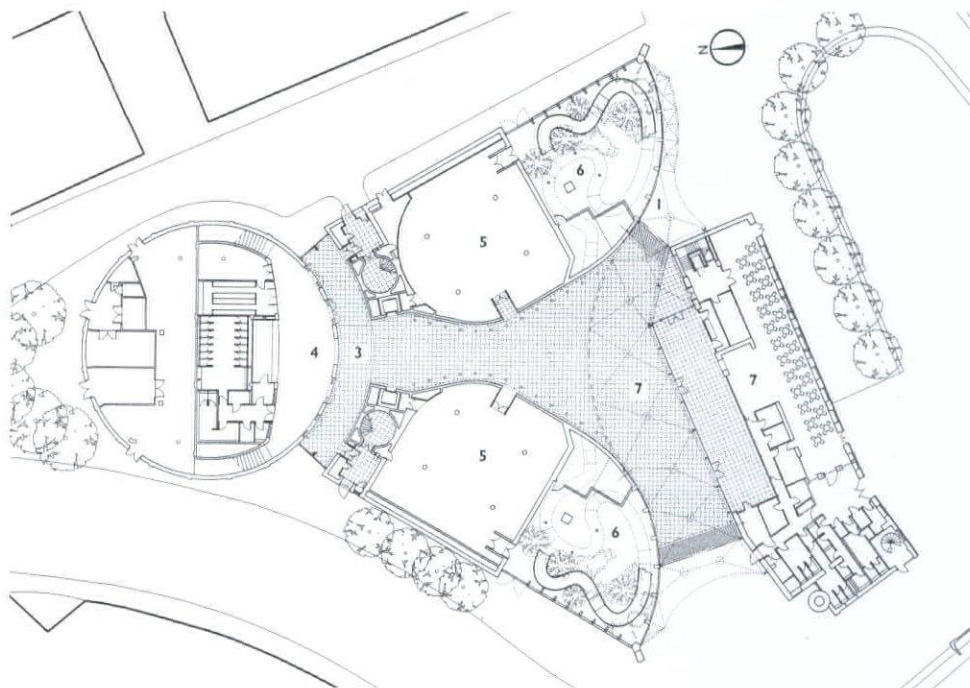
Millennium Commission grant £44 300 000

Total project cost £95 350 000

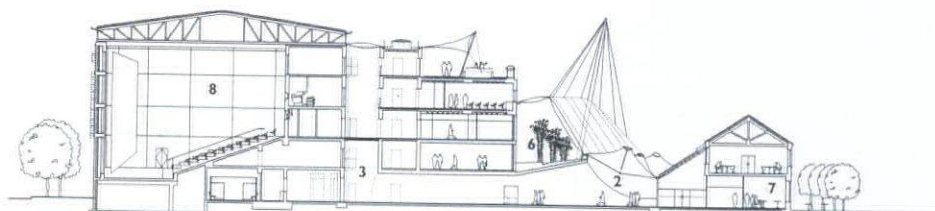


Wildscreen fourth floor

- | | |
|------------------|-------------------|
| 1 entrance | 6 botanical house |
| 2 foyer | 7 leadworks |
| 3 link | 8 IMAX |
| 4 bar | 9 terrace |
| 5 electronic zoo | |



Wildscreen ground floor (scale approx 1:1000)



Wildscreen section

NORFOLK HUB

A new learning and information centre in Norwich forms the heart of an electronic network aimed at tackling rural isolation and improving educational opportunities.

Norfolk is the UK's fifth largest county and one of its most sparsely populated. The rapid evolution of IT networks was seen as an opportunity to develop electronic information and learning systems which will help overcome problems of distance and rural isolation. At the hub of this network is the new Millennium Centre in Norwich, designed by Michael Hopkins & Partners. The brief called for a centre of knowledge, information and learning on a prominent site in the heart of the city. Branch libraries around the county will be electronically linked to the new building, which takes the place of Norwich's old Central Library destroyed by fire in 1994.

The site lies on the south-west corner of the city's popular, bustling market square, opposite the fifteenth-century church of St Peter Mancroft. A simple horseshoe-shaped building, three storeys high, encloses a

variety of different spaces, including a library, multi-media auditorium, and a business and learning centre. Oriented on an east-west axis, the curved end of the horseshoe sits in a garden, rather as the nearby church lies in its churchyard, while the eastern end opens up and addresses the city through an imposing glass wall. The various spaces wrap around and overlook a central covered courtyard, which constitutes the informal, social focus of the scheme. In the great tradition of nineteenth-century arcades, the courtyard is glazed, providing a generous public space less vulnerable to the vicissitudes of Norwich weather than the city's network of streets and market places. Here people can meet, congregate and linger in a café or get their bearings before making use of the building's facilities. Lightweight translucent fabric blinds stretched over the glass help to diffuse heat and glare.

The Norwich project continues and develops many of the practice's preoccupations, notably in the use of a horseshoe-shaped form, so memorably employed at Glyndebourne Opera House (AR June 1994) and subsequently at Emmanuel College (AR February 1996). And, like the new campus for Nottingham University (AR February 2000), it also reflects a concern with energy efficiency and environmental control. The thermal mass of the building's concrete frame naturally moderates temperature fluctuations and a heat recovery plant minimizes energy loss. As with all the Hopkins's buildings, materials are used with crafted, elegant economy. The earthbound solidity of brick external walls contrasts with the lightweight glass roof. Conceived as an accretive extension of the public realm, Norwich's Millennium Centre adds to the city's social, intellectual and civic life.



aerial perspective showing the building in its urban context

Architect
Michael Hopkins & Partners
www.hopkins.co.uk
Structural engineer
Whitby Bird & Partners
Mechanical and electrical engineer
Oscar Faber Group
Quantity surveyor
Turner & Townsend

Millennium Commission grant £30 069 000
Total project cost £61 038 000

THE ARCHITECTURAL REVIEW

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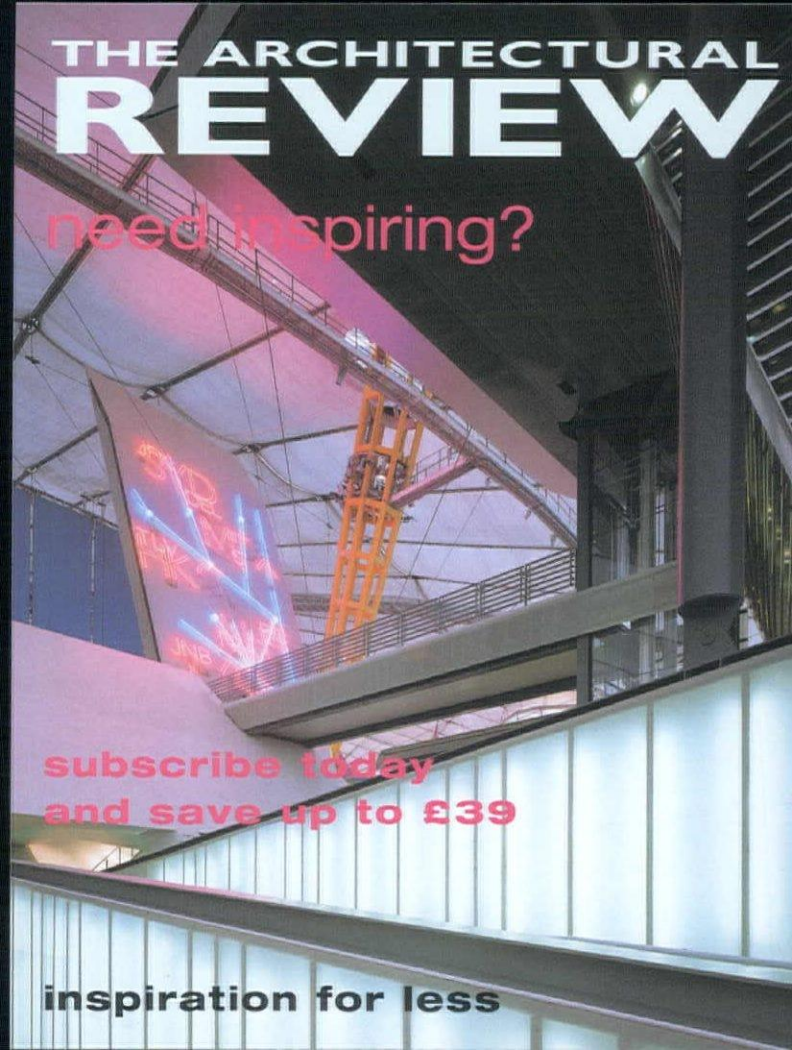
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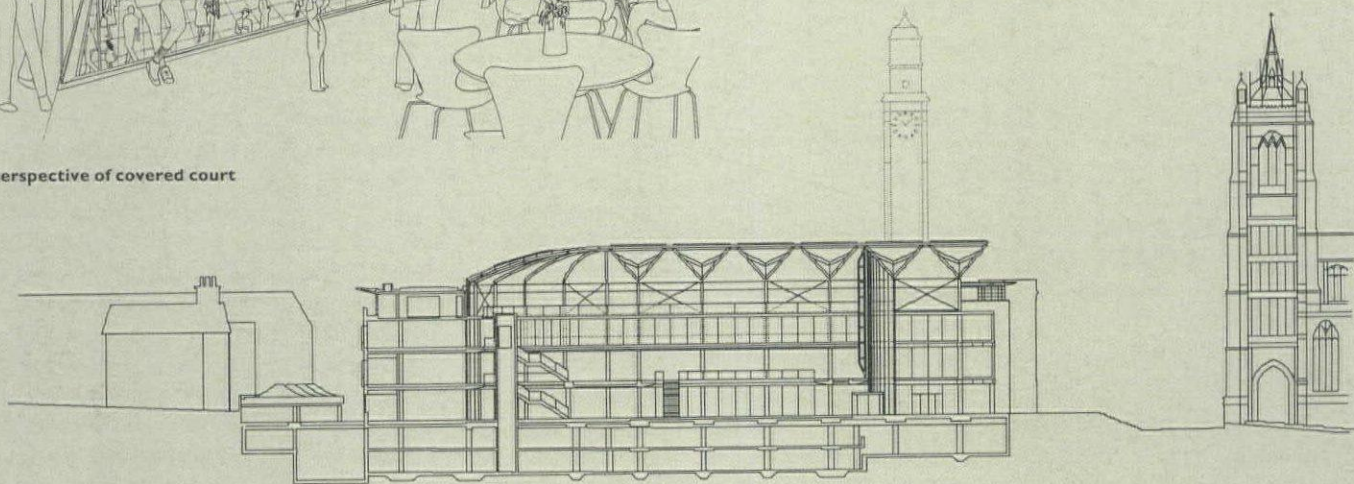
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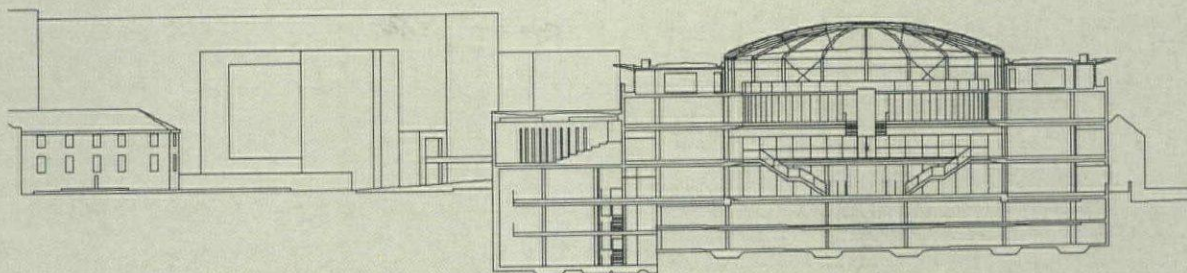


internal perspective of covered court

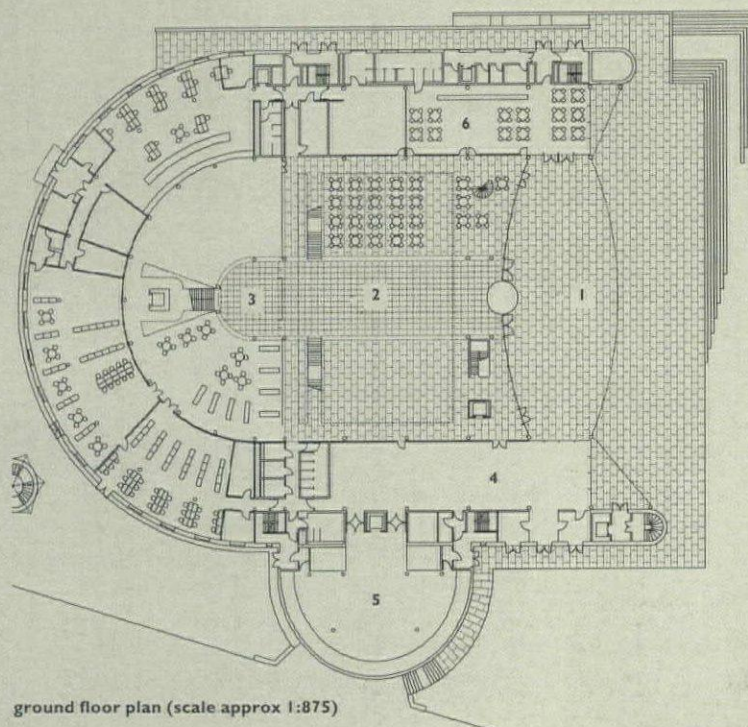


longitudinal section

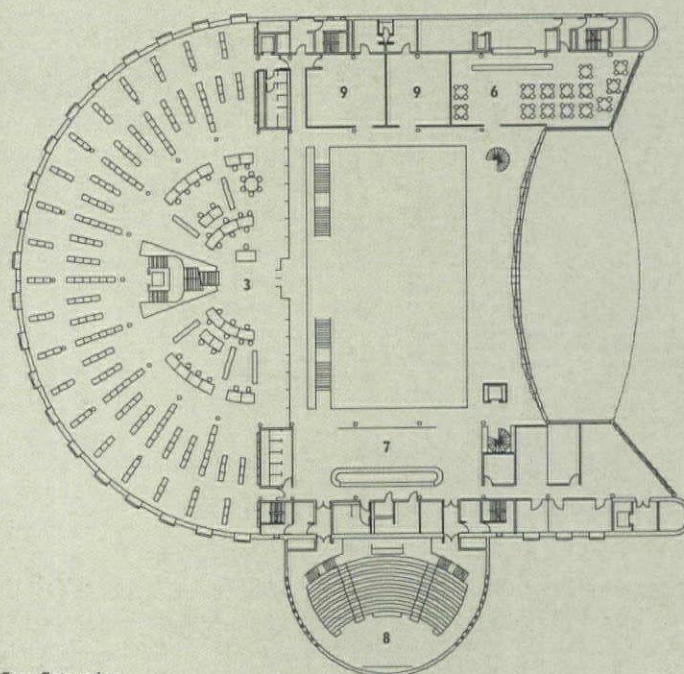
- 1 square
- 2 courtyard
- 3 library
- 4 tourist information
- 5 heritage attraction
- 6 café
- 7 foyer bar
- 8 auditorium
- 9 shops



cross section

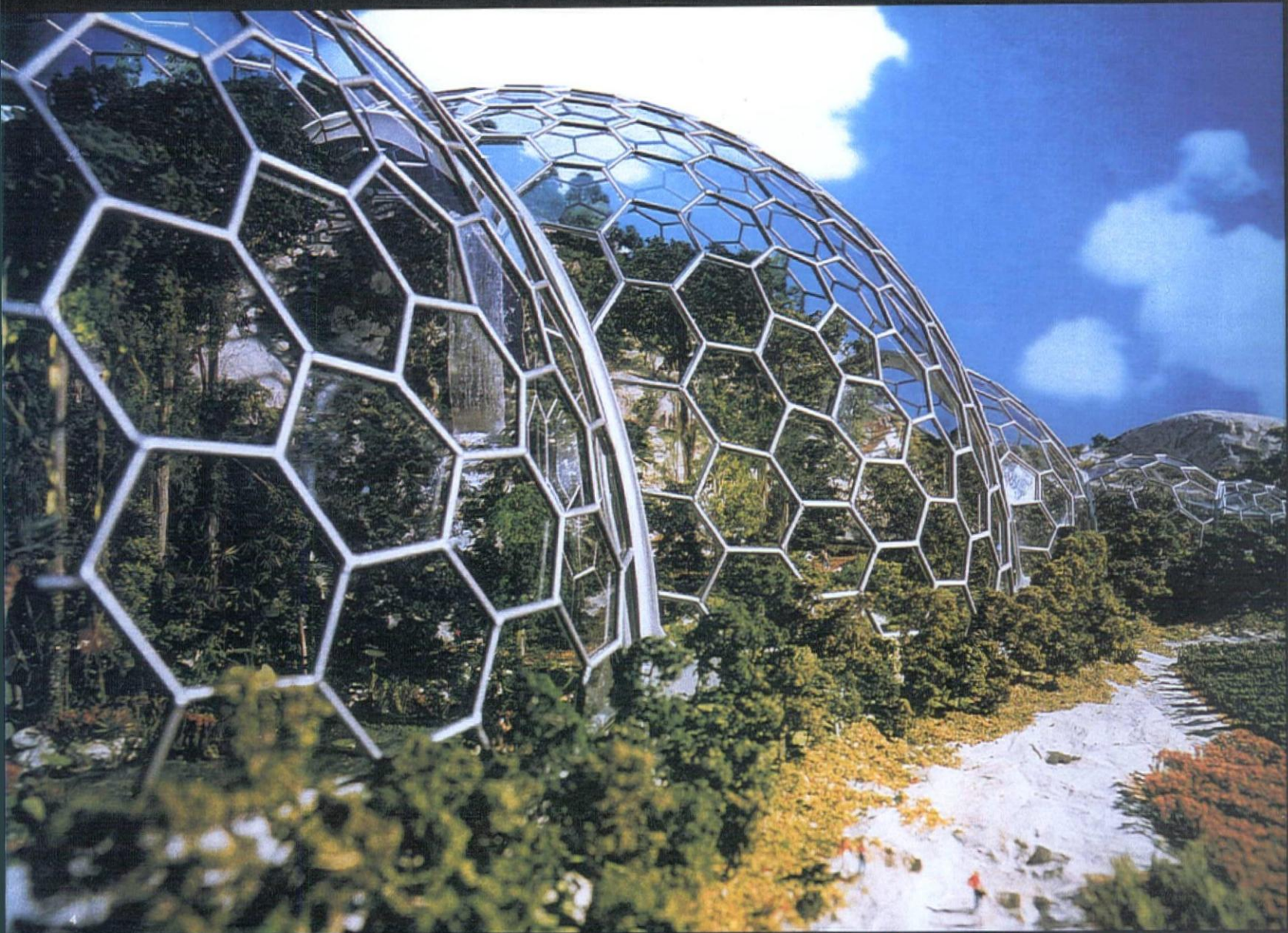


ground floor plan (scale approx 1:875)



first floor plan





4,5
Scale of biomes is hard to appreciate:
steel hexagons are about 9m across.

Architect

Nicholas Grimshaw & Partners, London

Design team

Andrew Whalley, Vanessa Bartulovic,

Jolyon Brewis, Vincent Chang,

Amanda Davis, Florian Eckardt,

Alex Haw, William Horgan,

David Kirkland, Oliver Konrath,

Quintin Lake, Richard Morrell,

Tim Narey, Monica Niggemeyer,

Mustafa Salmon, Killian O'Sullivan,

Debra Penn, Michael Pawlyn,

Tan Su Ling, Dean Boston,

Chris Brieger, Angelika Kovacic,

Martin Pirnie

Structural engineer

Anthony Hunt Associates

Services engineer

Ove Arup & Partners

Millennium Commission grant £40 150 000

Total project cost £80 350 000



As Britain's manufacturing prowess declines ever further, discovery and science centres are almost becoming a recognizable building type as the authorities try to inculcate some love for technology and the natural sciences in the young, and make them more comprehensible to the whole population. Not surprisingly, the centres tend to be in the nation's run-down industrial cities, as part of the attempt to improve their self-confidence and culture. Hence the large number of such projects in the Millennium Commission's portfolio.

When Britain was the workshop of the world, Birmingham was the forge. Now, as the city comes to terms with the new economy, its centre is being revitalized, and the Millennium Point project at Digbeth, on the eastern side of the urban centre, is intended to help energize the process.

The complex is to contain three distinct main elements: first, a Discovery Centre (DC) of the kind that is becoming familiar all over the developed world; second, a Technology Innovation Centre (TIC) which will have laboratories, workshops and lecture theatres run in conjunction with the University of Central England; third, the University of the First Age (UFA), a centre for development of 11 to 15 year olds, which will serve and offer specialized facilities to local schools. The building is in two parts. In what the architects call

the 'beam' (a 165m long, 22m high slab of flexible space), the TIC and the DC are at each end. In the middle is what they call the 'hub', which flows north in an irregular plan to accommodate the UFA, some commercial and office space, an IMAX and the main vertical circulation routes in a five-storey glazed atrium.

The different elements are articulated externally, with the IMAX which punches into the hub as a glass cylinder illuminated to become a beacon at night. On the south face of the beam, the TIC is fronted by a 3m deep glazed cavity wall which acts as a thermal flue, extracting stale air from the floors by convection to be expelled at roof level; remotely operated blinds moderate glare and heat gain. The Discovery Centre, with its quite different needs, has a screen of extruded ceramic louvres offset by a metre from its face, so that shaded areas of glass can be arranged to suit the nature of exhibits.

Architect

Nicholas Grimshaw & Partners, London

Design Team

Christopher Nash, Simon Beames, Richard Connor, Florian Eames, Gavin Finnan, Julian Flannery, Nicholas Grimshaw, Ewan Jones, Jim Keen, Jim King, Angelica Kovacic, Leonard Milford, Stuart Piercy, David Portman

Structural engineer

Buro Happold

Services engineer

Ove Arup & Partners

Landscape architect

Edwards Gale

Millennium Commission grant £50 000 000

Total project cost £113 400 000

MILLENNIUM POINT, DIGBETH, BIRMINGHAM, ENGLAND

ARCHITECT

NICHOLAS GRIMSHAW & PARTNERS

TO THE POINT

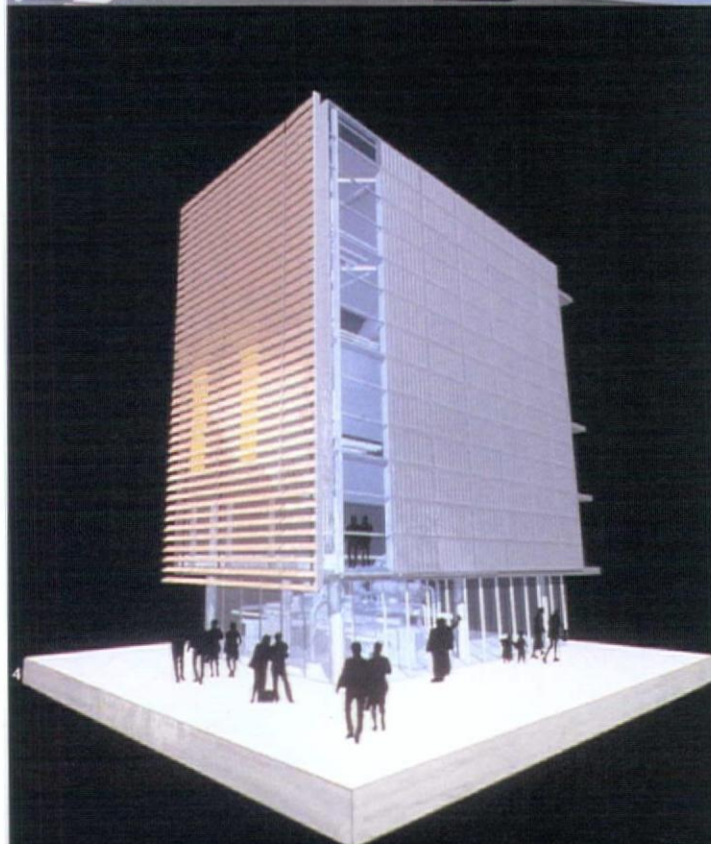
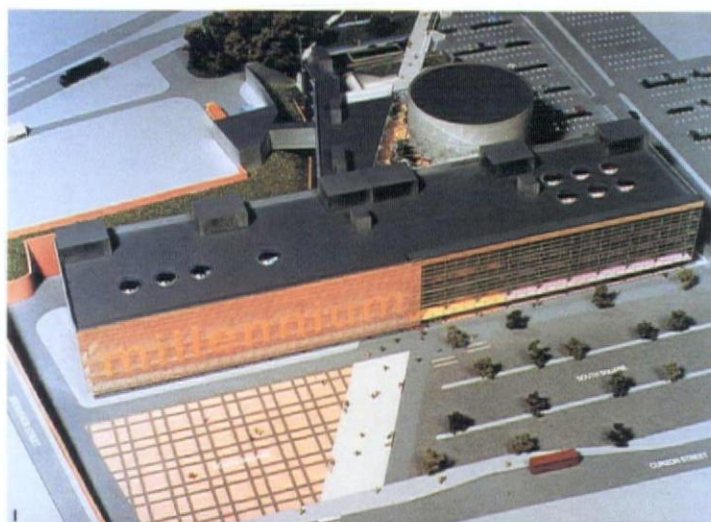
A multi-purpose science and education complex is intended to help England's second city regenerate.

1 Site model with 'beam' in foreground, 'hub' penetrated by drum of IMAX behind.

2,3 Technology Innovation Centre and Discovery Centre are given quite different treatments, with extruded

ceramic louvres fronting Discovery, and a deep glazed cavity wall before Innovation.

4 Detailed model of Discovery facade.



NATIONAL SPACE SCIENCE CENTRE, LEICESTER, ENGLAND

ARCHITECT

NICHOLAS GRIMSHAW & PARTNERS

SPACE CRAFT

Leicester University is a leading centre of space research: a new exploration centre is growing under its aegis.

Britain's National Space Science Centre (NSSC) is being built in Leicester in England's East Midlands on some disused underground storm water tanks. The tanks have been converted by placing a new roof plane over them and are added to by a tower in which rockets and other space craft can be displayed. The NSSC is to be closely linked – at least organizationally – to the Space Research Centre of Leicester University, which has a reputation for work on satellites and space exploration vehicles.

In fact, the NSSC will be an exhibition centre which is intended to rouse general interest in education and research into space sciences. The new square green roof is penetrated by a dome, the top of the planetarium, and round it will be a spiral of planting to evoke a galaxy, to be seen not from space but from the tower and the approach. In the low part there will be flexible exhibition space.

The tower which curves in both plan and section is of course much more conditioned by its big exhibits. It is the climax of the exhibition route and will be a light steel structure largely clad in ETFE foil (the stuff the same practice is using in the Eden Project, p82). Three layers of foil will be pneumatically inflated to provide a large scale transparent and insulative skin. Heat gain in summer is hoped not to be a problem, and the walls of the lower part can be opened on hot days to allow convection cooling. Completion is hoped to be in early 2001.

Architect

Nicholas Grimshaw & Partners, London

Design team

Christopher Nash, King Chong, Florian Eames, Matthew Eastwood, Jason Embley, Nicholas Grimshaw, James King, Andy MacConachie, David Portman, Steve Ritchie, Eva Scheffer

Structural engineer

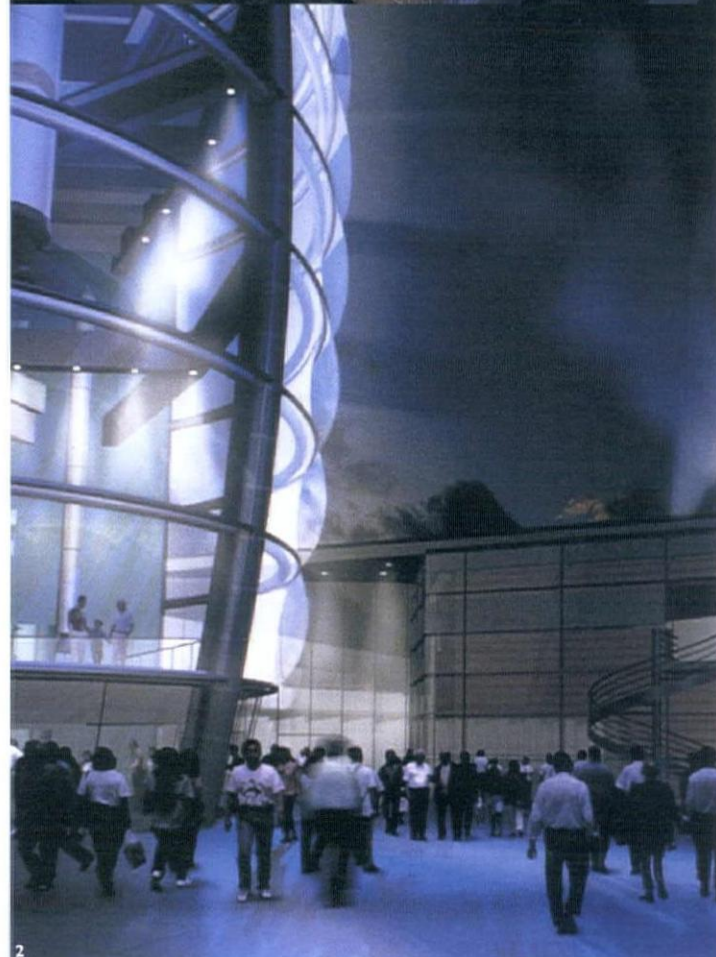
Ove Arup & Partners

Landscape architect

Land Use Consultants

Millennium Commission grant £23 250 000

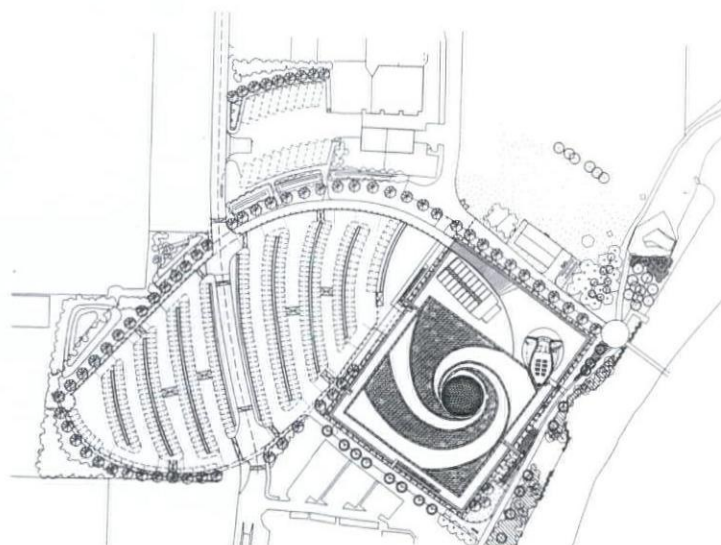
Total project cost £46 500 000



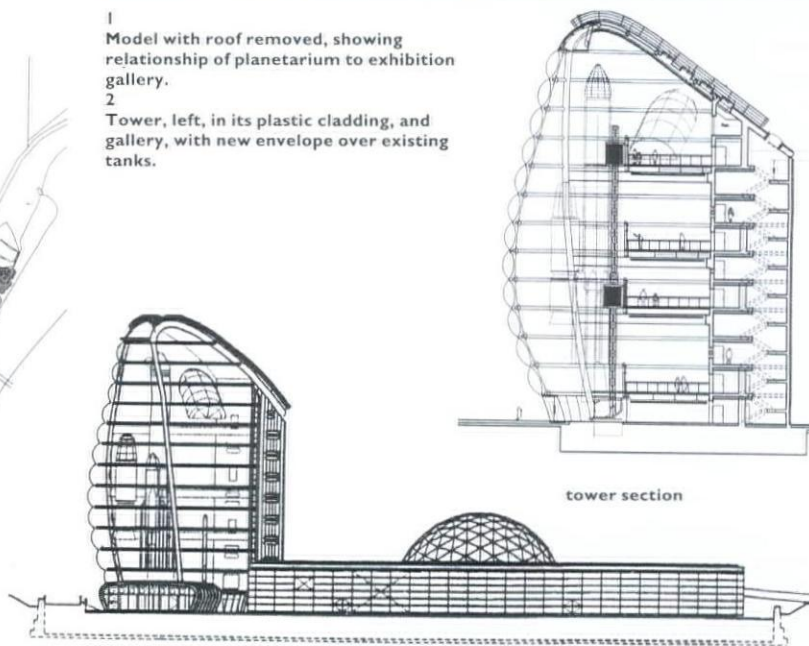
2

1 Model with roof removed, showing relationship of planetarium to exhibition gallery.

2 Tower, left, in its plastic cladding, and gallery, with new envelope over existing tanks.



site plan



north elevation

tower section

ARTS CENTRE, SALFORD, ENGLAND
 ARCHITECT
MICHAEL WILFORD & PARTNERS

THE ART OF LOWRY

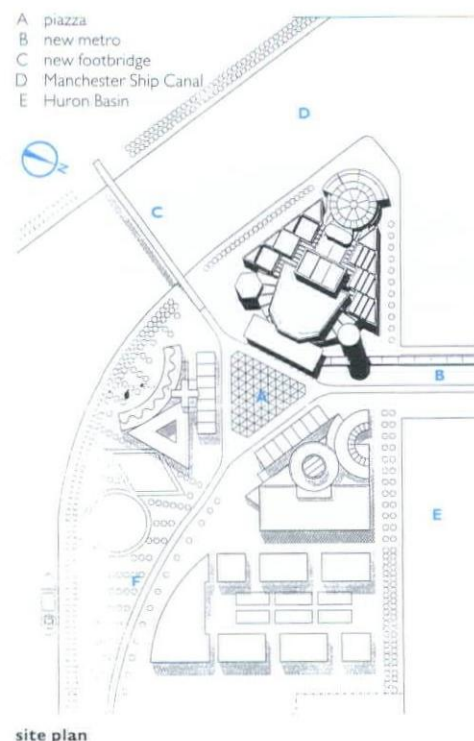
L. S. Lowry is the most famous of Salford's sons. He painted the tail end of the city's industrial strength in the first half of the twentieth century, with unforgettable etiolated images (simultaneously tragic and humorous) of sticklike workers hastening to their mills under great clouds and columns of smoke. Now, the smoke has gone with the heavy industry, but Lowry's name lives on in an arts centre due to open at the end of the month on the desert Salford Quays, .

Located at the end of a pier between the Manchester Ship Canal and the Huron Basin, the Lowry Centre by Michael Wilford & Partners is a dramatically scaled monument to urban regeneration which, though at the end of a promontory, can be reached in three directions: from a new footbridge over the Canal, a new metro station on the Huron Basin and the road which runs up the spine of

the pier. These converge on a new piazza which fronts the Centre (and is enclosed on its other two sides by new commercial buildings).

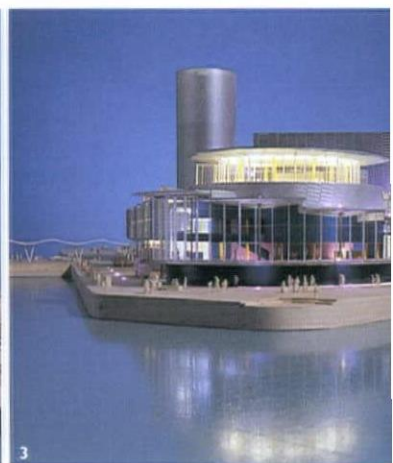
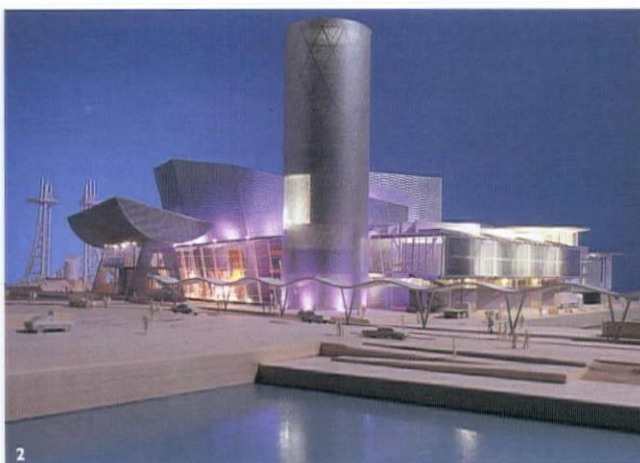
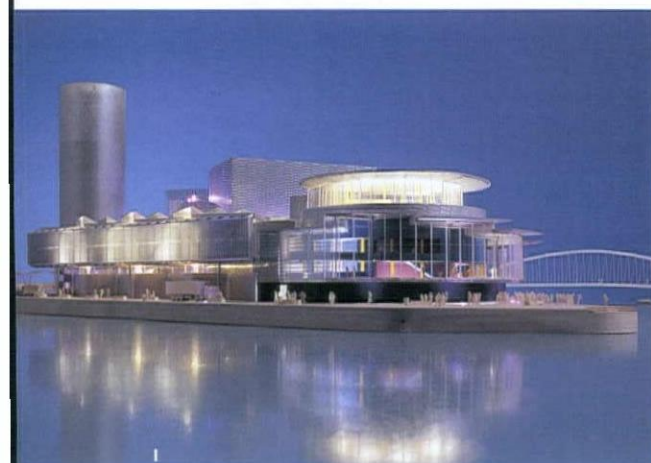
You approach the Centre from the piazza under a huge metal portico. This leads to a big and complex multi-level foyer that invites visitors to visit the three main elements of the complex. A 1650 seat lyric theatre, and a 450 seat adaptable theatre together form an axis terminating in the drum of the smaller space which celebrates the termination of the promontory. Flanking each side of the axis and emphasizing the triangularity of the parti are galleries which provide a great range of spaces and lighting conditions for displaying changing exhibitions and the city's collection of Lowry paintings. To the right of the entrance portico is a cylindrical tower which contains the Lowry study centre.

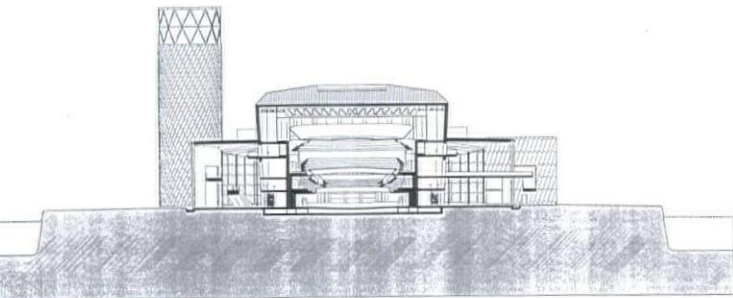
All the disparate elements are connected



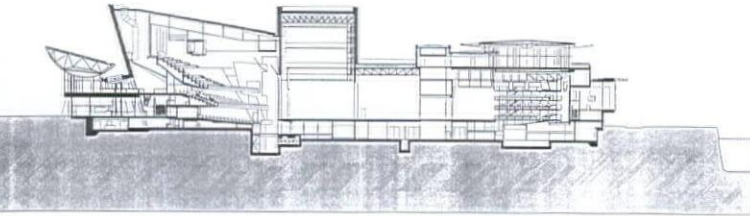
site plan

by an intricate three-dimensional weave of social spaces and public routes. Bar, café and restaurant which serve all elements of the complex are on the south side of the building, overlooking the calm and now pollution-free waters of the canal: on summer days, they can extend out onto terraces. There is a dress bar over the entrance serving the upper levels of the lyric theatre and overlooking the piazza; other bars serve the adaptable theatre and, at ground level, the foyer. Promenades link all these places and the entrances to the main volumes. Gentle ramps connect the foyers of the two theatres and offer views down into galleries. At the apex, the belvedere foyer of the adaptable theatre circles its curve and allows views west down the water. Then, a long loggia allows access to galleries on the Huron Basin side, and views of the





cross section of lyric theatre looking east



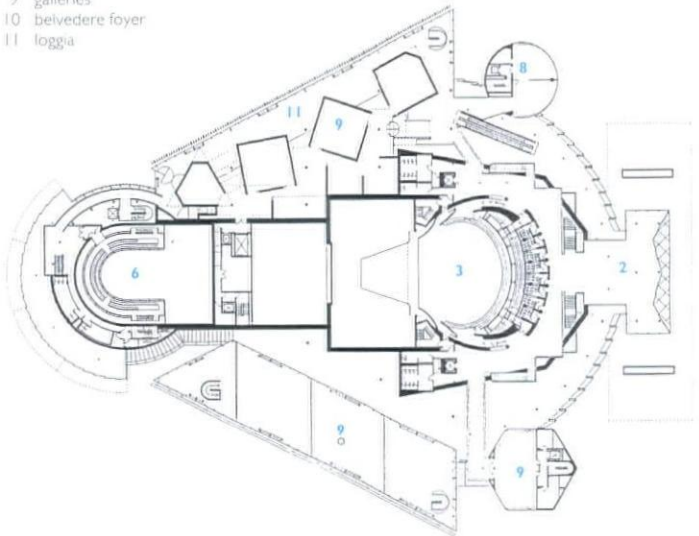
long section through theatres

regenerating city over the water, then a return to the ground level foyer down escalators. The sequence of public spaces is moving and one of the most urbane to be found in all the major millennium projects. The AR will be returning to examine it in detail when it is in use.

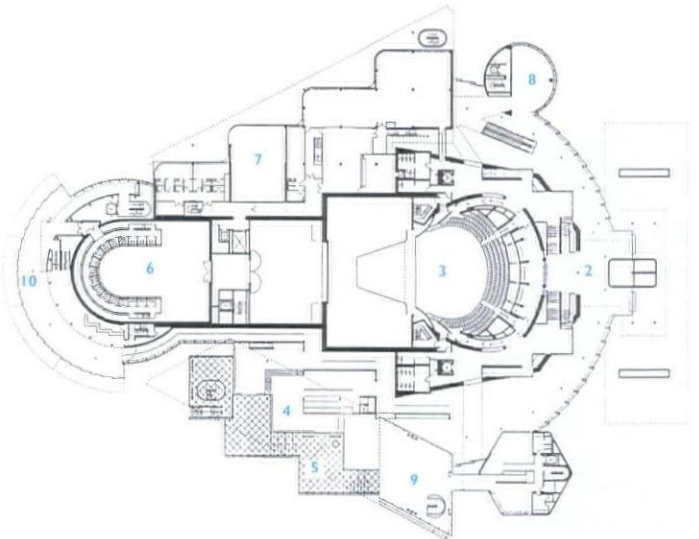
- Architect**
Michael Wilford & Partners, London
- Acoustics**
Sandy Brown Associates
- Structural, mechanical and electrical engineers**
Buro Happold
- Theatre consultant**
Theatre Projects Consultants
- Museum consultant**
Lord Cultural Resources
- Photographs**
Richard Davies

Millennium Commission grant £15 650 000
Total project cost £97 942 000

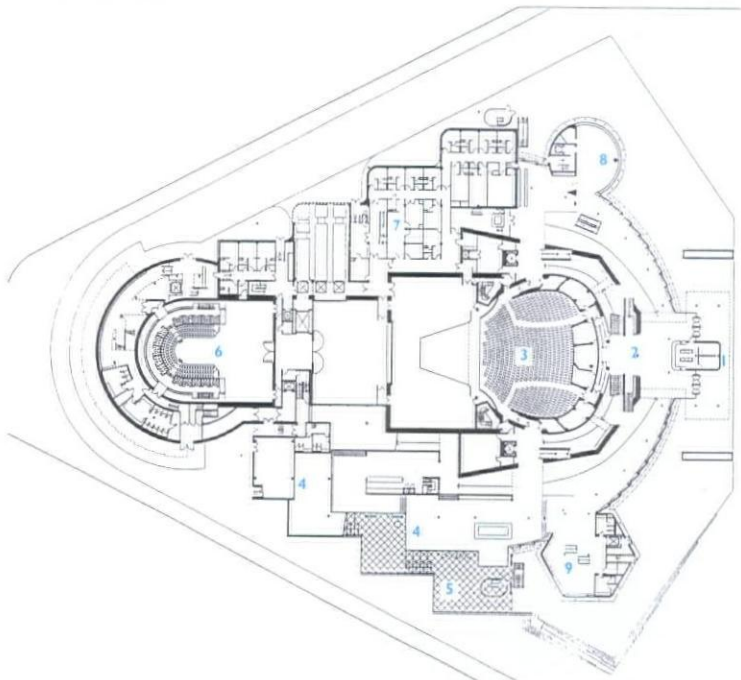
- 1 entrance
- 2 foyer
- 3 lyric theatre
- 4 restaurants and bars
- 5 terraces
- 6 adaptable theatre
- 7 backstage/administration
- 8 Lowry study centre
- 9 galleries
- 10 belvedere foyer
- 11 loggia



second floor plan



first floor plan



ground floor plan (scale approx 1:1500)



Sheffield was once the steel capital of the world, but its fortunes declined with those of British industry. Now, they have recovered to some extent. It is making as much steel as ever (though the new products are highly specialized, and made by far fewer people). The city has a new high-tech tram system and a combined district heat and power system which runs on town rubbish.

In the mid '90s, an ambitious plan for reviving the city centre was launched which made provision for improving and linking open spaces, introducing new uses (commercial as well as municipal) and downgrading traffic. A key element in the ambitious Heart of the City Project is the Winter Garden and Millennium Galleries. Pringle Richards Sharratt with engineers Buro Happold were appointed designers after competitive interview in 1966.

The two elements, though joined, are distinct. The Winter Garden runs roughly north-south, and is designed as a galleria, connecting two squares. Its progressively rising laminated timber parabolic arches will enclose a garden which will be open at all hours and available to everyone. Kiosks and cafés will provide daytime animation, but at night, the illuminated green path will be a key pedestrian link.

Halfway down the east side of the gardens, the galleries join the glasshouse. A long foyer gives access to the permanent collections: cutlery from Sheffield's past and the Ruskin Gallery, which will be devoted to the collections of the Guild of St George, an idealistic community founded in Sheffield by the Victorian sage as a riposte to the grinding awfulness of nineteenth-century industry. The largest gallery will be for temporary exhibitions most of which will be organized with the Tate Gallery and the Victoria and Albert Museum, the big national institutions in London whose bulging store-rooms contain far more than they can show. At the east end of the foyer, escalators and a lift connect to a lower level, where the fall in ground

allows a large café and the education department to open at street level towards Hallam Square, part of Hallam University. A major urban road runs between café piazza and square, and though its traffic is to be moderated, experiences of summer café customers on the terrace may be a little gasolenic.

The whole complex is informed by environmental concerns. Gallery vaults run parallel to the Winter Garden axis. These precast concrete elements (two to a vault), have been made with a pale mix incorporating micaceous sand to improve light-reflective properties. Reflected daylight enters through clerestories, bounces up into the shimmering vaults and is then diffused down onto the exhibits. As well as being a luminous device, the vaults provide thermal mass and insulation. Other thermal control elements are the galleries' hypocaust floors which are like raised office plates over a concrete slab.

Like the galleries, the Winter Garden will be a model of energy conservation. Its two-hinged parabolic laminated arches bear on tapered concrete columns through stainless-steel pins; they carry a secondary purlin structure which bears the double glass skin. There will be no supplementary heating, so the whole cathedral-like space is expected to be 5 or 6 degC above the local climate. In summer, trees and vegetation will shade the space, and automatic vents at the top of the vaults will open to make convection draw cooler air in at ground level. The floor slab will give stabilizing thermal mass.

Architect

Pringle Richards Sharratt Architects, London
www.prsarchitects.com

Design team

John Pringle, Penny Richards, Ian Sharratt, Douglas Oyugi, Basil Kalaitzis, Adam Blacker, Joanne Metcalf, Valerie von Truchsess, Tim Gledstone

Structural and services engineers

Buro Happold

Exhibition designer

Jasper Jacob Associates

Winter Garden landscape consultant

Weddle Landscape Design

Masterplan architects

HLM Architects

Millennium Commission grant £20 500 000

Total project cost £41 000 000

HEART OF THE CITY, SHEFFIELD

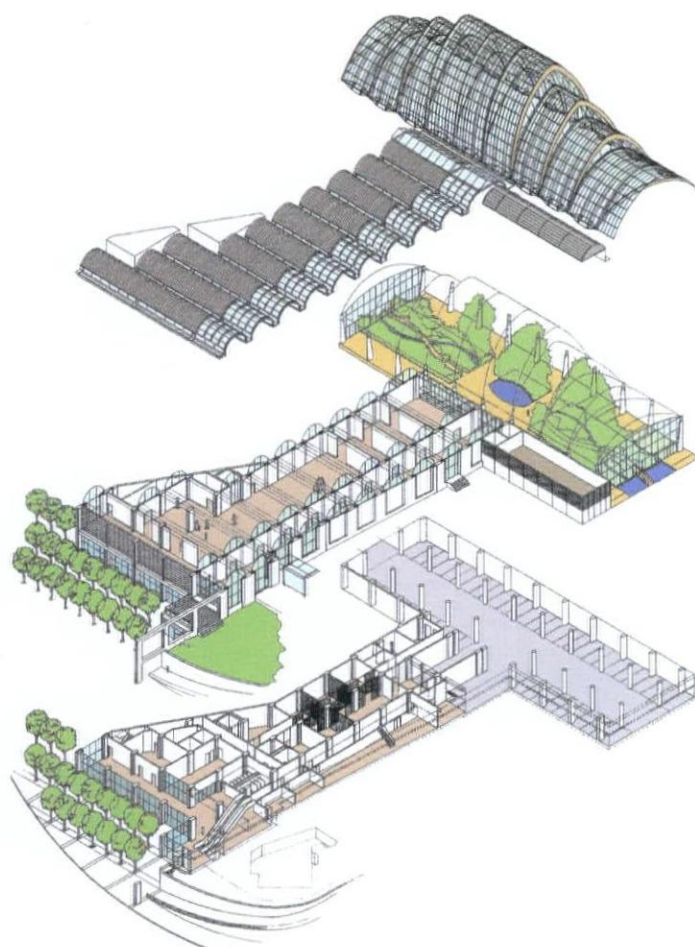
ARCHITECT

PRINGLE RICHARDS

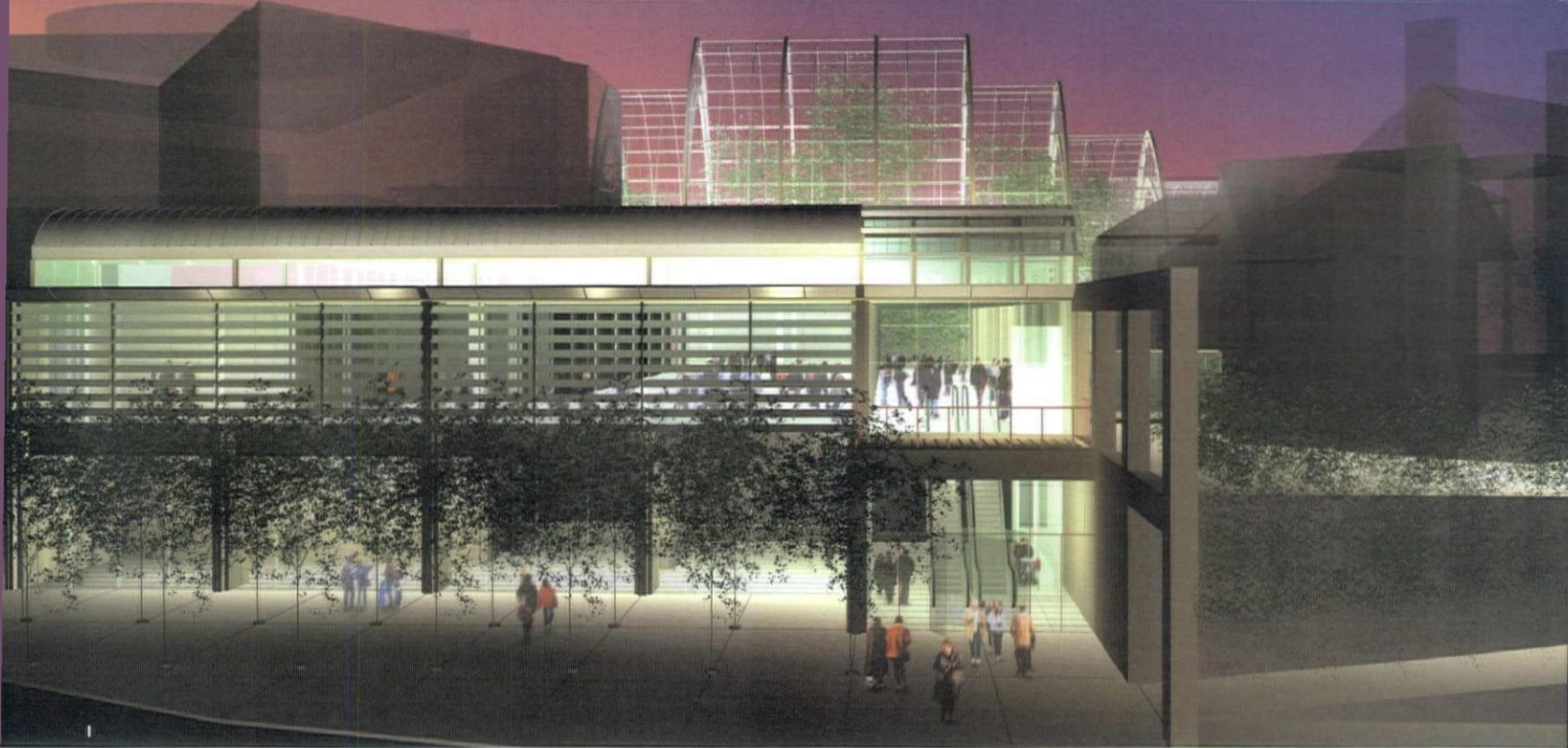
SHARRATT ARCHITECTS

CENTRING SHEFFIELD

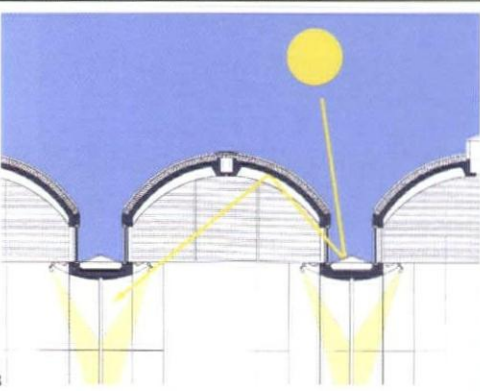
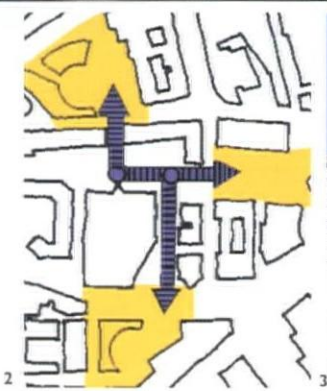
A major component in an ambitious plan to bring life back to the centre of a previously run-down city, this complex is a physical link and a source of inspiration.



dissected axonometric showing relationship of main elements



- 1 Two level east end of gallery wing, with temporary exhibition spaces over café.
- 2 Urban linking principles.
- 3 Gallery daylighting principles.
- 4 Perspective of winter garden.
- 5 Perspective of temporary exhibition area.





DOWN TO EARTH

The first of the major millennium projects to be opened to the public, this park and natural history centre on old coal workings appropriately focuses on regeneration.

EARTH CENTRE, DONCASTER, ENGLAND

ARCHITECTS

FEILDEN CLEGG, ALSOP & STÖRMER, LETTS WHEELER

LANDSCAPE ARCHITECT

ANDREW GRANT ASSOCIATES

1 Gateway by Feilden Clegg; left, restaurant; right, Planet Earth galleries.

2 Planet Earth galleries made with excellently crafted local limestone. Slender reeds grow out of blue glass beds.

3 Green oak slats provide an external skin to glass box of restaurant building.

South Yorkshire used to be one of the most productive coalfields in the world, but now most of its pits are closed and both community and landscape have a chance of recovering from the wasteland of pollution and desolation created by the Industrial Revolution. The Earth Centre, near Doncaster, is the 26 acre (10.5ha) core development of a 400 acre (160ha) country park which is being created on the site of two disused collieries. It was the first Millennium Landmark project to open, and has had some of the most varied and thoughtful design inputs of any of the major millennium works. Modelled on the excellent German Bundesgartenschauen, the project is to be a permanent and developing community amenity (unlike the earlier cack-handed British experiments with the

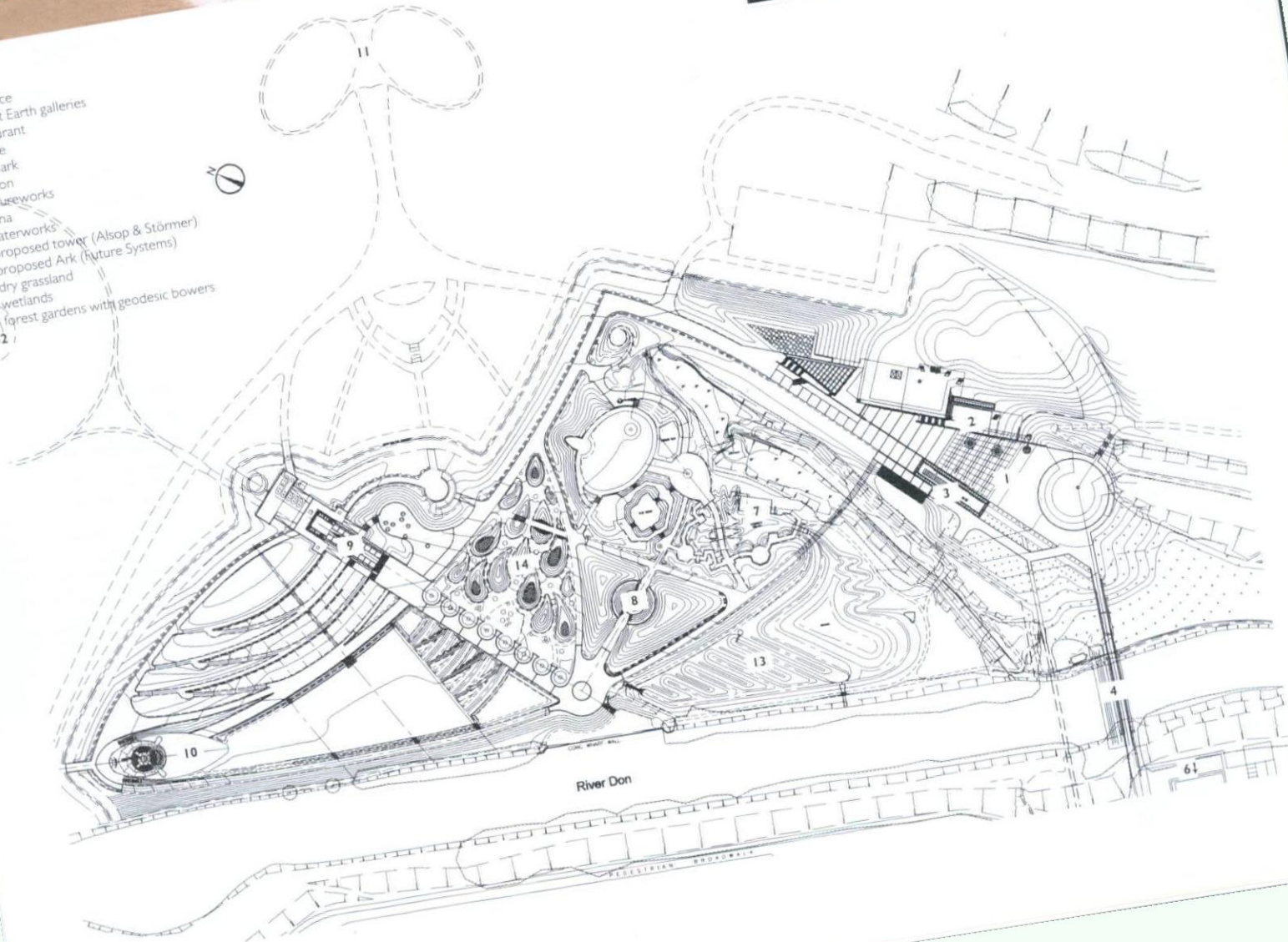
idea in the Thatcherite '80s, where the original German system of providing amenities for run-down cities, was subverted to become cheap launch pads for second-rate development).

From the first, the Earth Centre was intended to be the exact opposite of what had been there before: sustainable (not polluting), public (not private), a source of inspiration for the twenty-first century (not a remnant of the nineteenth). A masterplan by the Derek Lovejoy Partnership with Ove Arup & Partners swept away the industrial buildings, remodelled the landscape and started reforestation. Detailed landscape treatment of the core was undertaken by Andrew Grant Associates. The overall aim is to provide diversity by celebrating the natural variety of

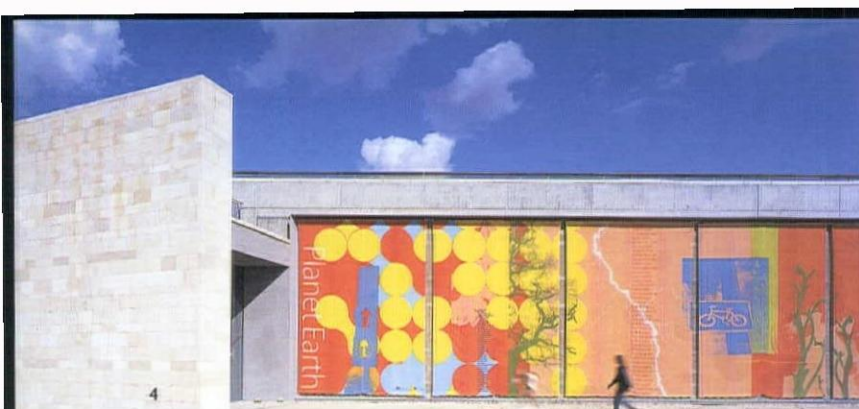
the site: roughly, to the north soil is acid, made of the waste of deep coalmining; to the south it is alkaline, formed from limestone upper strata. In counterpoint (and sometimes harmony) with this sequence is a north-south sequence from higher to lower, with a grassland meadow zone on the upper ground and gradually, as the ground falls to the now relatively unpolluted river Don, vegetation changes from dry to wet forms. A complex geometry both weaves the different elements together and emphasizes the particular nature of the topography and its chemistry. Descending from the meadow zone are terraces with different plantings, a zone of forest gardens, a wetland area near the river, and these are interspersed with events: a children's play area, an arena and a spiral of coal



- 1 entrance
- 2 Planet Earth galleries
- 3 restaurant
- 4 bridge
- 5 car park
- 6 station
- 7 Natureworks
- 8 arena
- 9 Waterworks
- 10 proposed tower (Alsop & Störmer)
- 11 proposed Ark (Future Systems)
- 12 dry grassland
- 13 wetlands
- 14 forest gardens with geodesic bowers



layout plan



4



5

EARTH CENTRE, DONCASTER, ENGLAND

ARCHITECTS

FEILDEN CLEGG, ALSOP & STÖRMER, LETTS WHEELER

LANDSCAPE ARCHITECT

ANDREW GRANT ASSOCIATES

4

Unhappily, trendy graphics intrude into the middle of Feilden Clegg's calm ashlar ...

5

... which supports a flowery roof that allows visitors to look over the whole site.

6

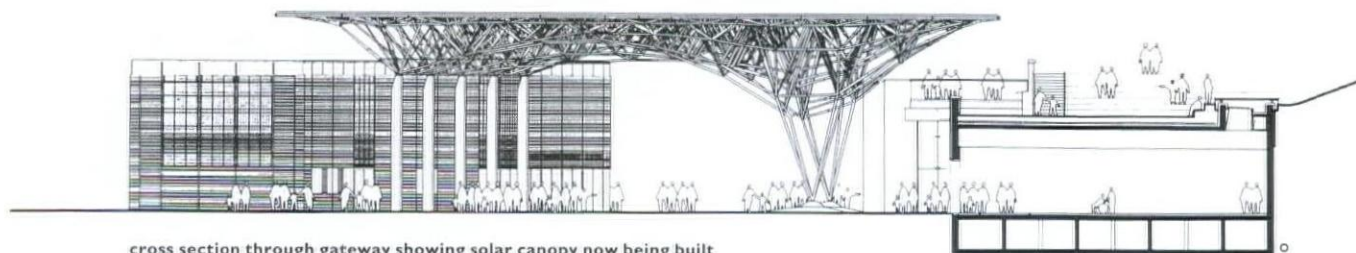
Planet Earth: outer gallery where daylight pours down onto model of Don valley.

7

Restaurant: a luminous and cheerful place within the double-skinned wall.

8,9

Landscape events by Andrew Grant Associates like geodesic bowers and pyramids for climbers are largely made from green wood, formed into shape on site.



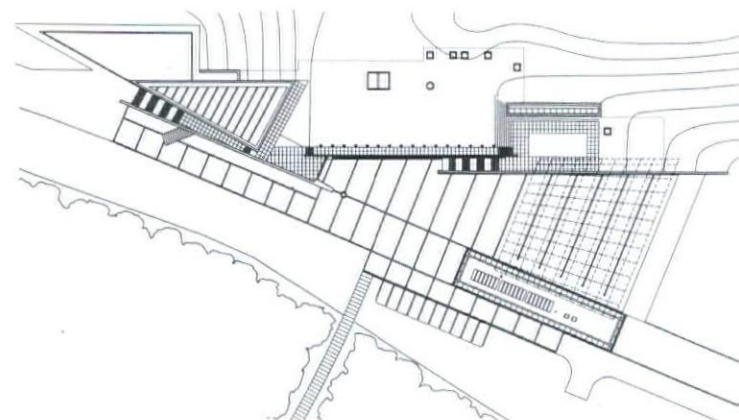
cross section through gateway showing solar canopy now being built

and limestone which greets visitors as they arrive from the bridge to the car park on the other side of the river. Smaller celebrations of place are created by forming arches, geodesic bowers and tunnels out of timber thinnings (the spindly young trees that are cut out in forestry to allow their fellows to grow large, and which have little commercial value). They are used green (without seasoning) with the advice of Buro Happold who gained experience of such techniques working with Richard Burton at Hooke Park (AR September 1990). In at least one instance, an arch is being made of live willow saplings.

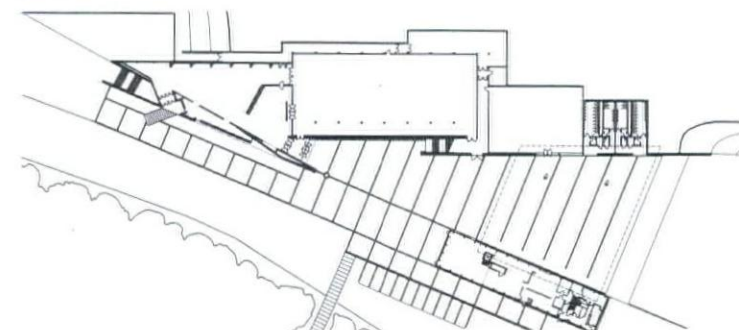
Major landmarks are buildings. Feilden Clegg have produced the gateway: a contrasting pair of structures which form a funnel leading to the interior of the park after you have crossed the Don

bridge from the car park or station. To the left is a glass rectangle protected by an outer skin of green oak slats: this is the restaurant, a cheerful airy and luminous place which provides excellent locally sourced food. To the right are the Planet Earth galleries, partly buried in the artificial hill under a flower sprinkled grass roof, and partly exposed as planes of well-crafted ashlar: local limestone which rather unfortunately forms a frame for a trendy and dull graphic welcoming panel – still, this can be changed, or better still, replaced by something in carved stone. Within, a long topit space contains a large and detailed model of the Don valley. This leads to subterranean galleries devoted to shows about ecology and its local lessons.

At the moment, the two sides of the entrance are being



roof level



entrance level (scale approx 1:1400)





EARTH CENTRE, DONCASTER, ENGLAND

ARCHITECTS

FEILDEN CLEGG, ALSOP & STÖRMER, LETTS WHEELER

LANDSCAPE ARCHITECT

ANDREW GRANT ASSOCIATES

connected by a solar canopy: a ceremonial timber entrance grove supports a 1000m² plane of photovoltaic panels. They will generate 80 000 kW of energy to provide between 20 and 30 per cent of the galleries' total needs.

So far, the other buildings on the site are the Natureworks and the Waterworks. Letts Wheeler designed the Natureworks, an exhibition gallery for water and terrestrial ecology poised over the park's largest pond at the edge of a small coppiced wood. It is an elegant little pavilion, made as far as possible out of standard components on a steel frame structure. Glass and timber cladding were chosen for economy and durability. Unheated, the space is cooled in summer by air from the pool which flows up by convection through the slatted oak floor.

Waterworks, by Alsop and Störmer, is another simple steel frame, this time on a purple concrete plinth. It houses the Living Machine, which uses natural processes of plants and algae to purify waste water. It is the centrepiece of a demonstration sustainable sewage and water management system for the whole complex, and the upper part (clad in the Millennium material ETFE) is a viewing gallery of the hydroponic tanks in the plinth. Through them, water is drawn by gravity and progressively cleaned by the vegetation. It is a modest, touching little building by a firm notorious for its gestures.

The big gesture at the Earth Centre is to be the Ark, designed by Future Systems, a very big multi-level exhibition and exposition complex cut into the rising ground to the north of

the site and covered with a huge multi-coloured lightweight roof. Again, photovoltaic panels will contribute to energy demands. The Ark is in phase three of the development, which is expected to start at the end of 2001. By then, the landscaping will have begun to settle in, and so presumably will management policies which are intended to increase the approachability of the place for the public.

Architect

Feilden Clegg Architects

Structural engineer

Atelier One

Environmental engineer

Atelier Ten

Landscape

Andrew Grant Associates

Waterworks

Architect

Alsop & Störmer

Structural engineer

Atelier One

Environmental engineer

Atelier Ten

Water treatment

Living Technologies

Landscape

Andrew Grant Associates

NatureWorks

Architect

Letts Wheeler Architecture & Design

Structural engineer

Price & Myers

Landscape project team

Masterplanner, landscape architect

Andrew Grant Associates

Infrastructure engineer

Ove Arup & Partners

Specialist seed mix/perennial planting design

Nigel Dunnett & James Hitchmough

Grid shell structures

Buro Happold

Landscape shelters

Atelier One

Photographs

1,5,6,7,11 Martine Hamilton Knight

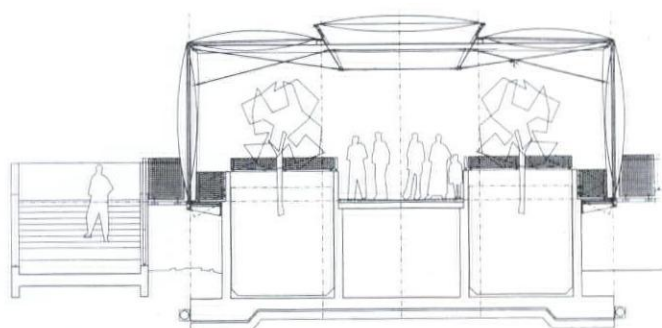
2,3,4,8,9,10,12,13 Dennis Gilbert/VIEW

Millennium Commission grant £50 000 000

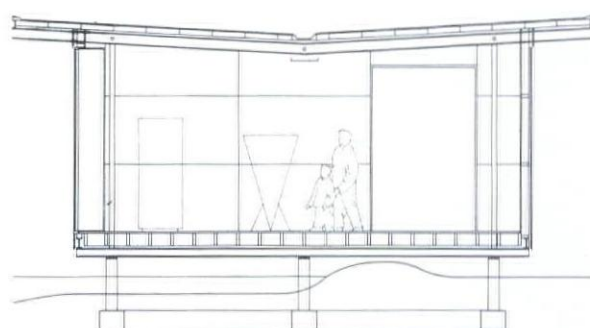
Total project cost £100 000 000



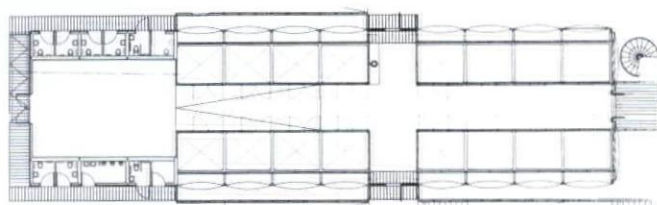
- 10 Waterworks by Alsop & Störmer: a steel frame ...
 11 ... clad in the millennium material, ETFE, which ...
 12 ... encloses hydroponic tanks that purify dirty water naturally.
 13 Natureworks by Letts Wheeler, a calm little steel-framed pavilion in which freshwater life is explored.



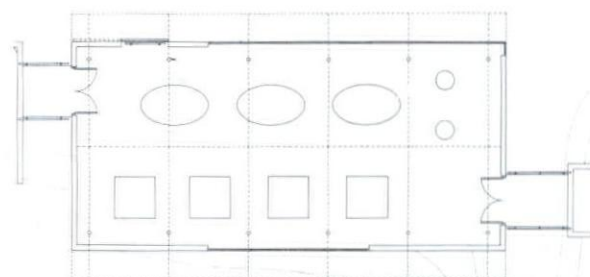
Waterworks cross section



Natureworks cross section



Waterworks plan (scale approx 1:500)



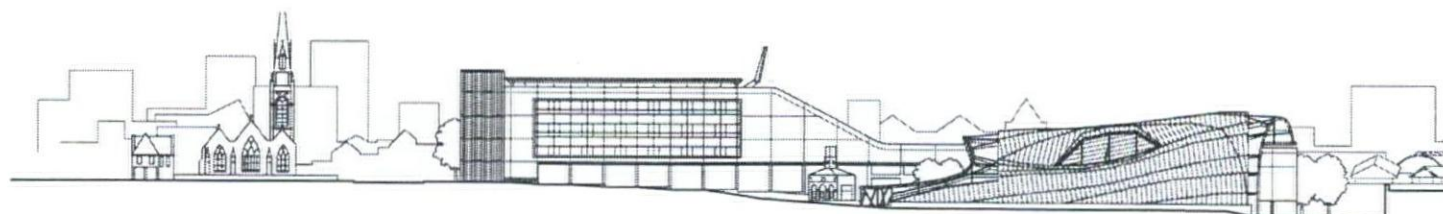
Natureworks plan (scale approx 1:300)



**INTERNATIONAL CENTRE FOR LIFE,
NEWCASTLE**
ARCHITECT
TERRY FARRELL & PARTNERS

GENETIC ENGINEERING

Education and research are two of the key themes of the Millennium effort. The International Centre for Life will serve science and inject new spirit into Newcastle.



context section



site plan

The International Centre for Life, designed by Terry Farrell & Partners, stands on a prominent 10 acre site next to Newcastle's central station. Its important purpose is partly educational and partly to provide facilities for scientific research and development, in particular into genetics and DNA (Francis Crick and James Watson, who discovered DNA in 1953 are the patrons of the centre.)

The main elements of the Centre are: a Genetics Institute, a Bioscience Centre for biotechnology business, a Bioethics Forum for examining the implications of rapid advances in genetics, a fully equipped 'Superlab' for local schoolchildren, the Helix Gallery – a kind of indoor DNA theme

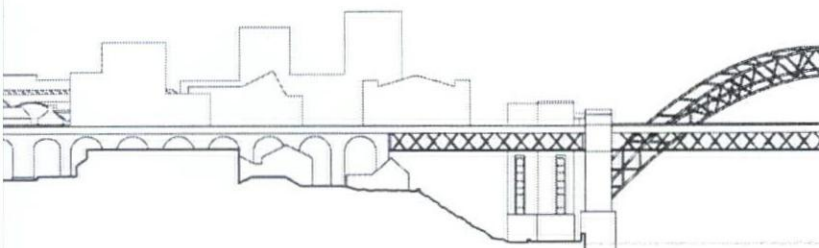
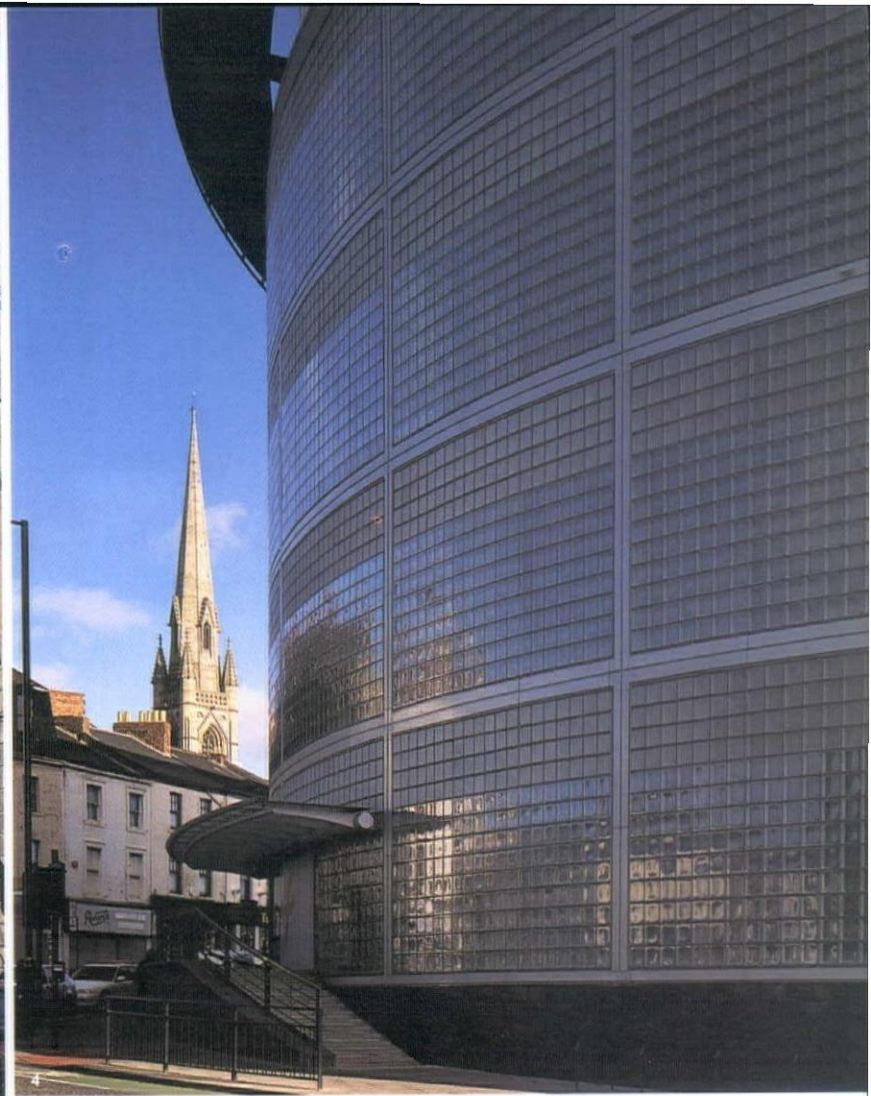
park with a motion simulator, brain show, theatre and interactive exhibits, and a Global Garden.

The scheme, curving north-south around the easterly edge of the site, is characterized by separation of parts and articulated links. Visually, buildings are given distinguishing colours taken from DNA codings: green (Global Garden roof), yellow (Bioscience and Genetics), blue (Genetics) and red (internal wall, Global Garden).

Appropriately, the centre curves embryonically around a central square, its north-south spine traced by a public footpath through the site. Another historic route, the path of an old road, is picked out by paving and

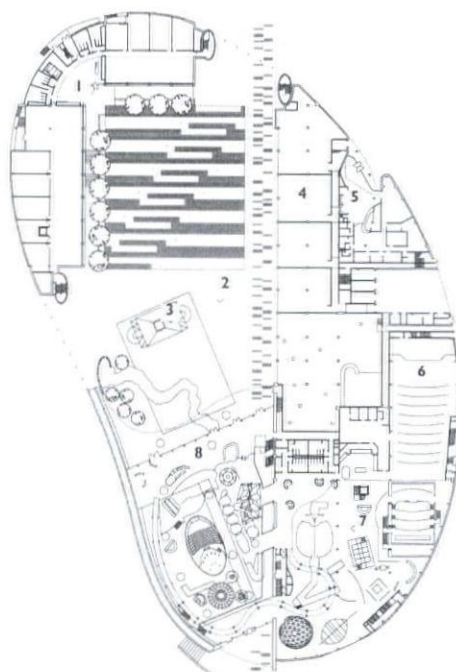
runs diagonally through the square from a ceremonial gateway between Bioscience and Genetics. An old market keeper's house in the square, like a navel in the body, has been restored and is an umbilical cord with the past.

The business-like Genetics Institute is oriented towards the street rather than the square, and linked to the lower Helix Gallery by a 'ski slope'. It sets in motion a spiral that cascades down to the gallery's lowest curve, and at this point, the geometry refers back to the domestic scale of the market keeper's house. Aesthetically, the exterior of the gallery, which is a black box contained by a skin of profiled metal, relates to the industrial aesthetic of railyards.



On the south-west, the Global Garden provides entrance to the gallery. Sheltered by an undulating copper canopy on a wooden skeleton, the garden's form and content celebrates life's diversity. The organic nature of the building was inspired by the structure and complex geometries of a leaf. Achieved by advanced computer techniques, it is pure sculpture.

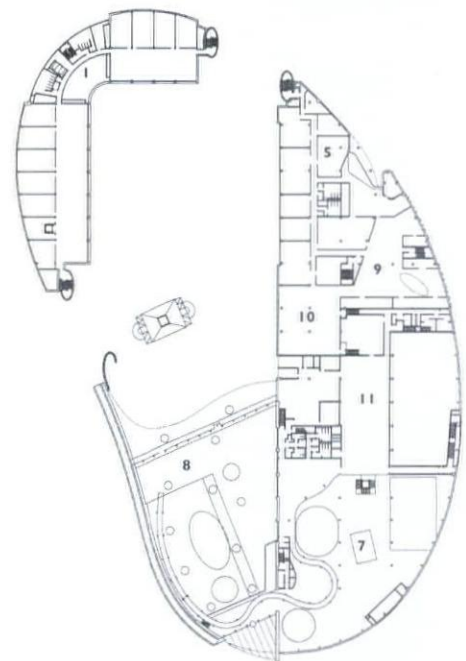
- 1 Yellow Bioscience Centre in foreground shelters new public space containing market keeper's house.
- 2 From south-west, green roof of Global Garden dominates the composition.
- 3 From north looking towards new public space.
- 4 North side of Bioscience Centre.



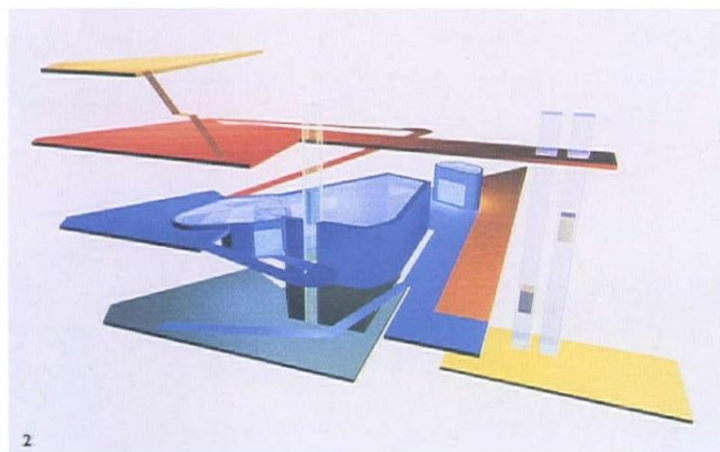
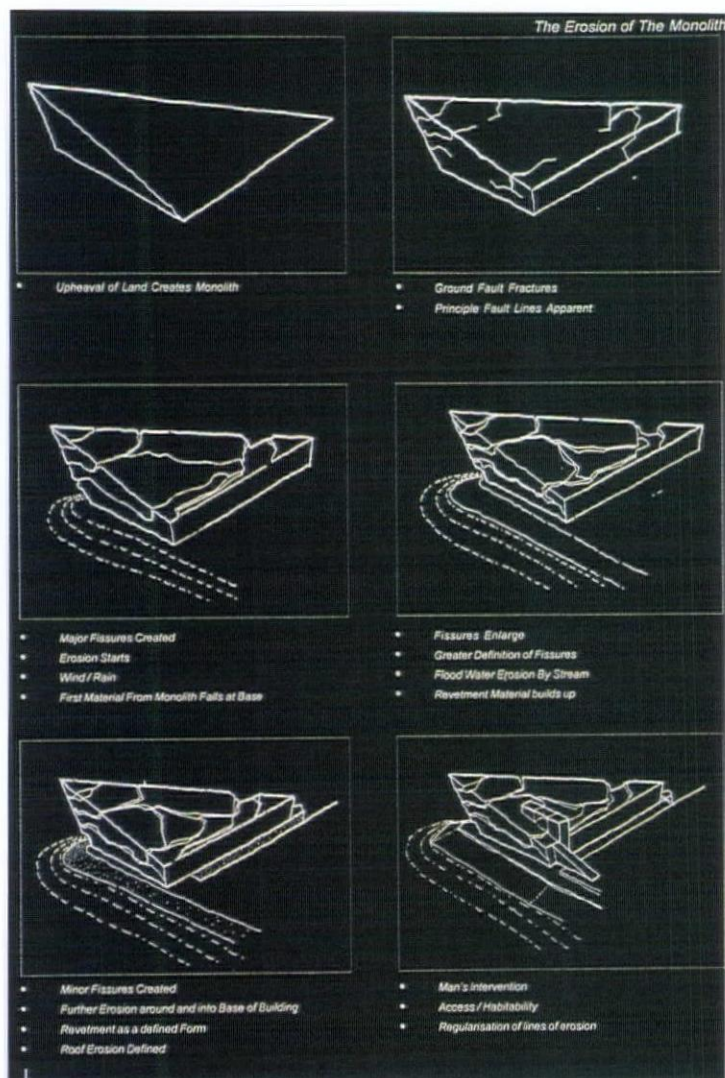
ground floor plan (scale approx 1:2200)

- 1 Bioscience Centre
- 2 Times Square
- 3 market keeper's house
- 4 retail
- 5 Genetics Research Institute
- 6 conference
- 7 visitor centre
- 8 Global Garden
- 9 consulting clinic
- 10 education suite
- 11 Helix Gallery

Architect
Terry Farrell & Partners
Engineers
Mott MacDonald
Landscape architect
Gillespies Environmental Design
Helix Exhibition designer
Event Communications
Photographs
Tim Soar



first floor plan



THE DEEP, KINGSTON UPON HULL

ARCHITECT

TERRY FARRELL & PARTNERS

Once, Kingston upon Hull was the greatest fishing port in the world and Britain's largest ship-building city. Because of the natural decline of fish stocks (and an absurd series of decisions taken about European fishing policy by successive Conservative governments), the place has deteriorated. Perhaps it was never wonderful architecturally or in terms of urban form, but it was vigorous, and the birthplace of William Wilberforce, the English MP who got Parliament to outlaw slavery in the British Empire in 1807 and set in train one of the greatest world convulsions of the nineteenth century.

The Deep is proposed as an urban regeneration scheme, a welcome project which will radiate energy into the somewhat forlorn city. (Coincidentally, the place has become much less desperate recently, since Hull's telecommunications company, in which the city has a large stake, has become one of the largest 100 companies in Britain.) At Sammy's Point, the crucial confluence of the little river Hull and the huge mouth of the Humber through which Yorkshire drains into the North Sea, the new centre is to be a complex organism, built on a desert site. An icon was asked for, and that is what the citizens

are to be given by Terry Farrell & Partners. It is to be a place to visit, an educational and research resource.

The architects talk about an evolving morphology. A huge prismatic monolith is supposed to have emerged: a mass of rock bearing a crystal (which becomes a look-out point for views over the rivers and the great bridge over the Humber). Metaphorically, the mass is supposed to have been eroded by time and weather, so revealing its strata, and allowing openings to be created for access and light. Metaphors continue inside, where the spaces are supposed to have been influenced by the nature of the ocean: surging, fluid, changing as you move round, non directive, with a life of their own.

Architect

Terry Farrell & Partners, London

Project team

Terry Farrell, Aidan Potter, Julian Tollast, Mike Stowell, Chris Wade, Simon Baker, Tom Gent, Peter Barbalov, Nemwa Dimka, Gita Joshi, Roger Simmons, Bobby Desai, Darren Cartledge, Moz Hussain, Matt Holder, Erica Jong, Nigel Bidwell, Bede Morganti, Jason Speechly-Dick

Civil & structural engineers

Jubb & Partners

Mechanical & electrical engineers

Waterman Gore

Landscape architects

Casella Ltd

Millennium Commission grant £18 476 000

Total project cost £37 702 748

OCEAN DEEP

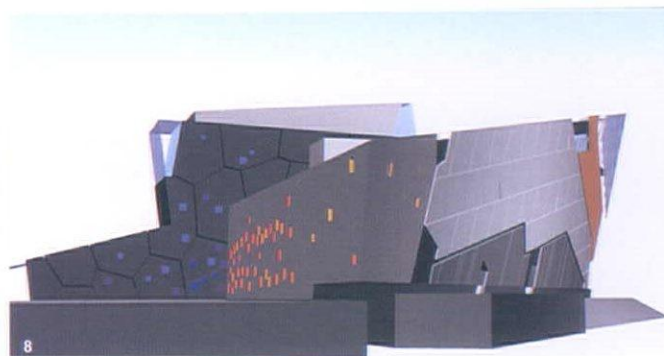
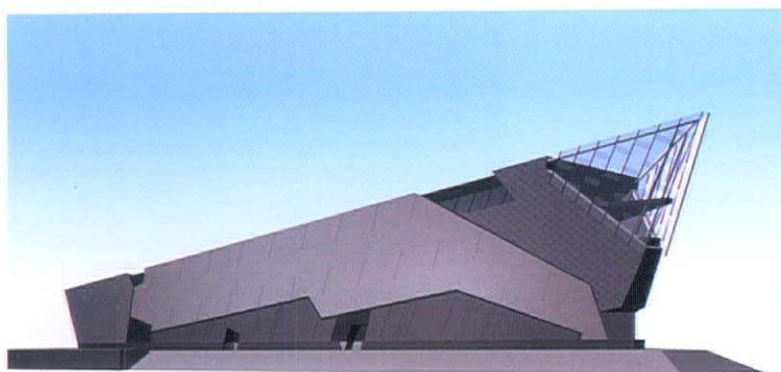
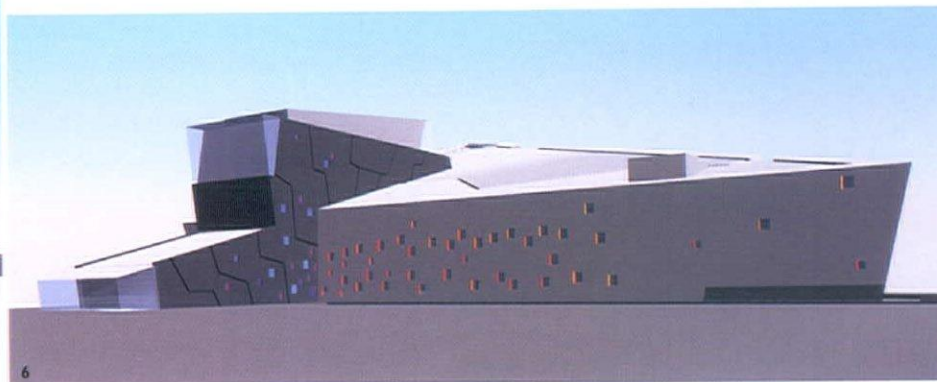
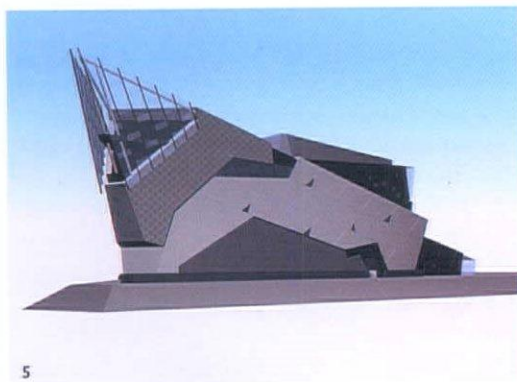
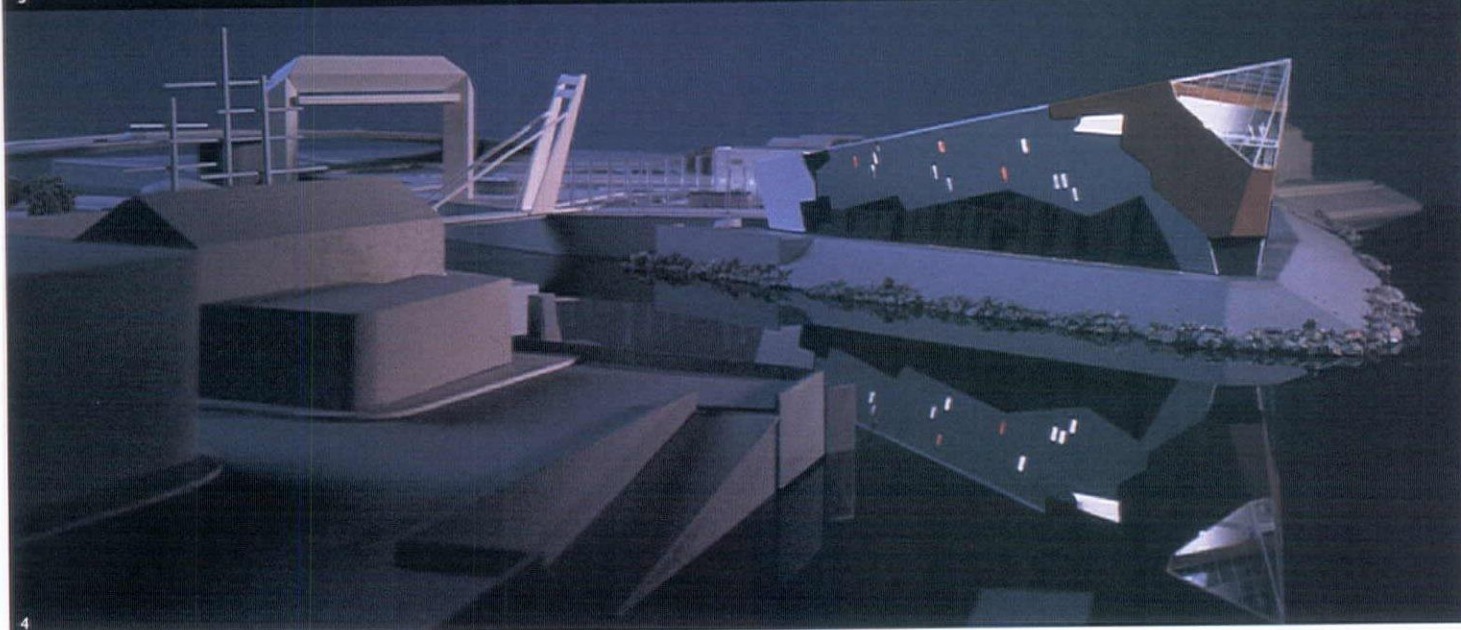
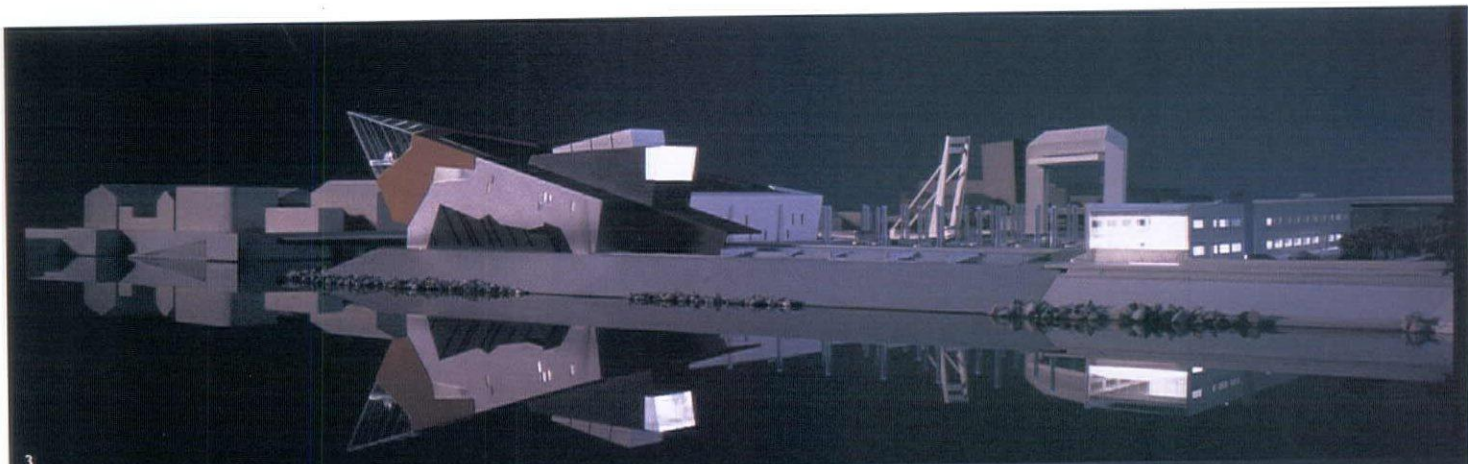
A museum devoted to the oceans is intended to help revitalize what was the world's greatest fishing port.

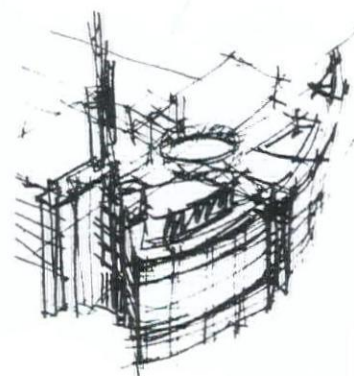
1
The monolith emerges.

2
Fluid internal spaces.

3,4
Site is a confluence of rivers Humber and Hull: tidal barrier on Hull is big portal in background.

5-8
Monolith is supposed to have been eroded to reveal strata in which windows and other openings appear.





REGENERATIVE JOURNEY

Belfast's new sports, sciences and film centre is a brave attempt to mix very different functions to regenerate a decayed part of the city centre.

ODYSSEY PROJECT, BELFAST, NORTHERN IRELAND

ARCHITECT

CONSARC DESIGN GROUP

Belfast waterfront, like those of most other Western seaboard cities needs new uses as industry changes. The Odyssey Millennium Project is intended to bring back life to the harbour and form a focus for community. With water on two sides, the Queen's Quay site comes to an apex at the junction of the Lagan river and the Abercorn Basin, and forms the gateway to the largely redundant shipyards on Queen's Island. Just to the south is a new weir across the river, which makes it non-tidal in front of the site, and at the same time provides a pedestrian path that puts the Odyssey within five minutes' walk of the city centre.

Seen from across the river, the complex is signalled by a sweeping, shield-like wall of silver metal and glass. This is the public front of the Science Centre, one of the three main elements of the project. The others are a sports arena and the Pavilion, a large commercial entertainment and retail complex. Approach will be mainly from the south from the bus route and car park. The main entrance leads into the central court of the Pavilion, what promises to be a lively 25m high space topped by a peaky fabric roof. Entrance is signalled by canopy and flagpoles (there are separate ones to both science centre and arena, so the different parts will be openable separately). It must be admitted that, from this side, the building with its varied forms, and red clay terracotta tiles (chosen to echo Belfast's Victorian brick) coheres less well than from the north, with each element trying to signal independence from its siblings.

The central court is surrounded by two possible floors of retail spaces for shops, bars and restaurants. At ground level, it gives access straight ahead to the atrium entrance to the Science Centre, and right to the arena. Above retail level, the Pavilion is a cinemathèque, with a generous south-facing foyer, and 12 ordinary cinemas of

different sizes, complemented by an IMAX theatre. There is also a free-standing foyer in the Pavilion court at mezzanine level.

The Science Centre has three 8m high floors, arranged with the possibility of inserting mezzanines inside the curved north facade. Spaces have been left as fluid as possible to allow curators maximum freedom in arranging their interactive displays, but the centre also contains a 200 seat lecture theatre, meeting and teaching areas and a working laboratory as well as offices and workshops.

The Arena, almost a separate building under its oval dome, can contain 10 000 spectators who look down on a permanent ice-pad surrounded by a 200m athletics track, the camber of which can be adjusted hydraulically. Spectators reach their seats from a concourse 5m above ground level. The upper tiers of seats are fixed but those below the concourse are retractable, allowing maximum area for indoor athletics.

The complex is expected to be finished in November. Experience will tell whether the admirable notion of creating urbanity by mixing commercial, sporting and educational functions will become a real bit of city.

Architect

Consarc Design Group, Belfast

Design team

John McNeill, Tony Stevens, Joan McCoy, Brian Madden, Sean Tunney, Victoria Moore, Neil Armstrong, Kate Moore

Arena architect

Marshall Haines & Barrow: John Barrow, Mike Trice

Civil and structural engineers (Pavilion and Science Centre)

Kirk McClure Morton

Structural, mechanical and electrical engineer (arena)

Oscar Faber

Mechanical and electrical engineer (Pavilion and Science Centre)

Delap & Waller

Landscape architect

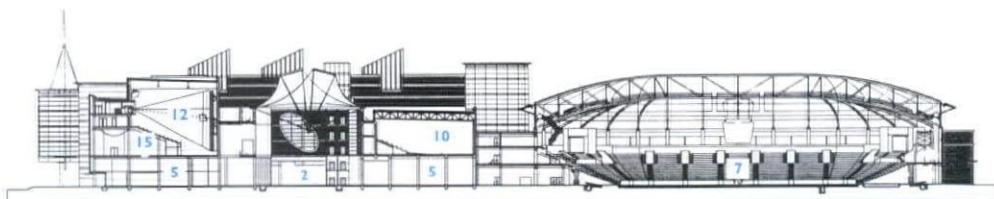
Ferguson McIlveen

Millennium Commission grant £45 000 000

Total project cost £90 000 000



3

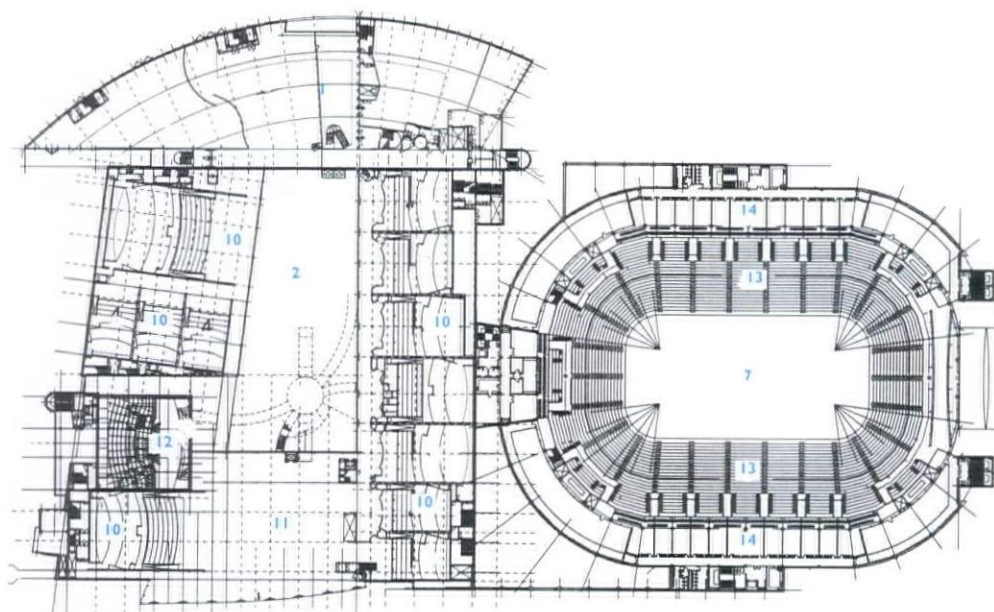


west-east section



site plan

- A Abercorn Basin
- B River Lagan
- C motorway
- D weir
- E car park
- F main entrance



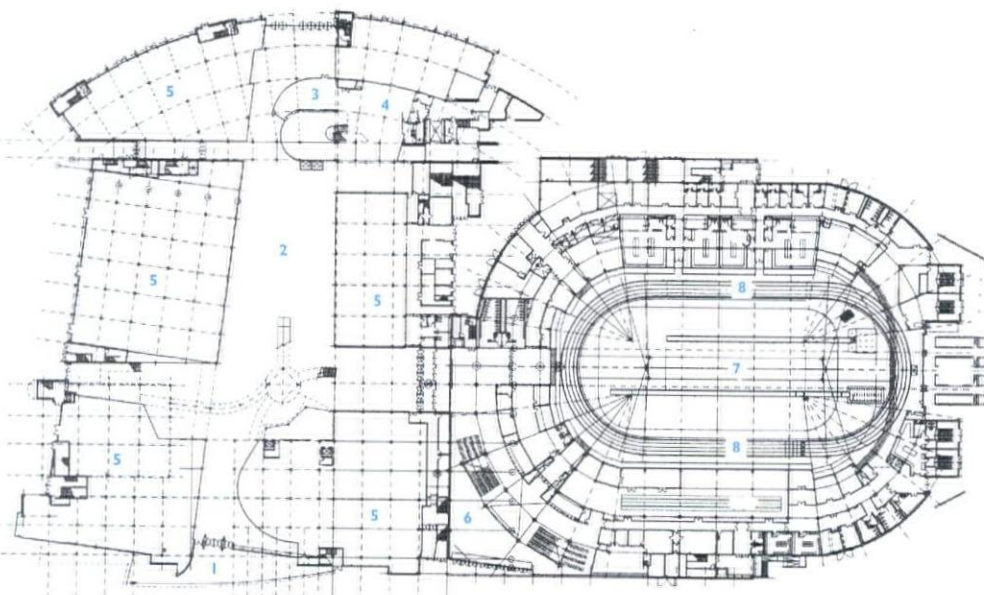
first major level

- 1 main entrance
- 2 court
- 3 Science Centre entrance
- 4 Science Centre temporary gallery
- 5 shops, bars, cafés
- 6 Arena entrance
- 7 ice-pad
- 8 running track
- 9 Science Centre galleries
- 10 cinema
- 11 cinema foyer
- 12 IMAX
- 13 arena seating
- 14 entertainment boxes
- 15 IMAX foyer

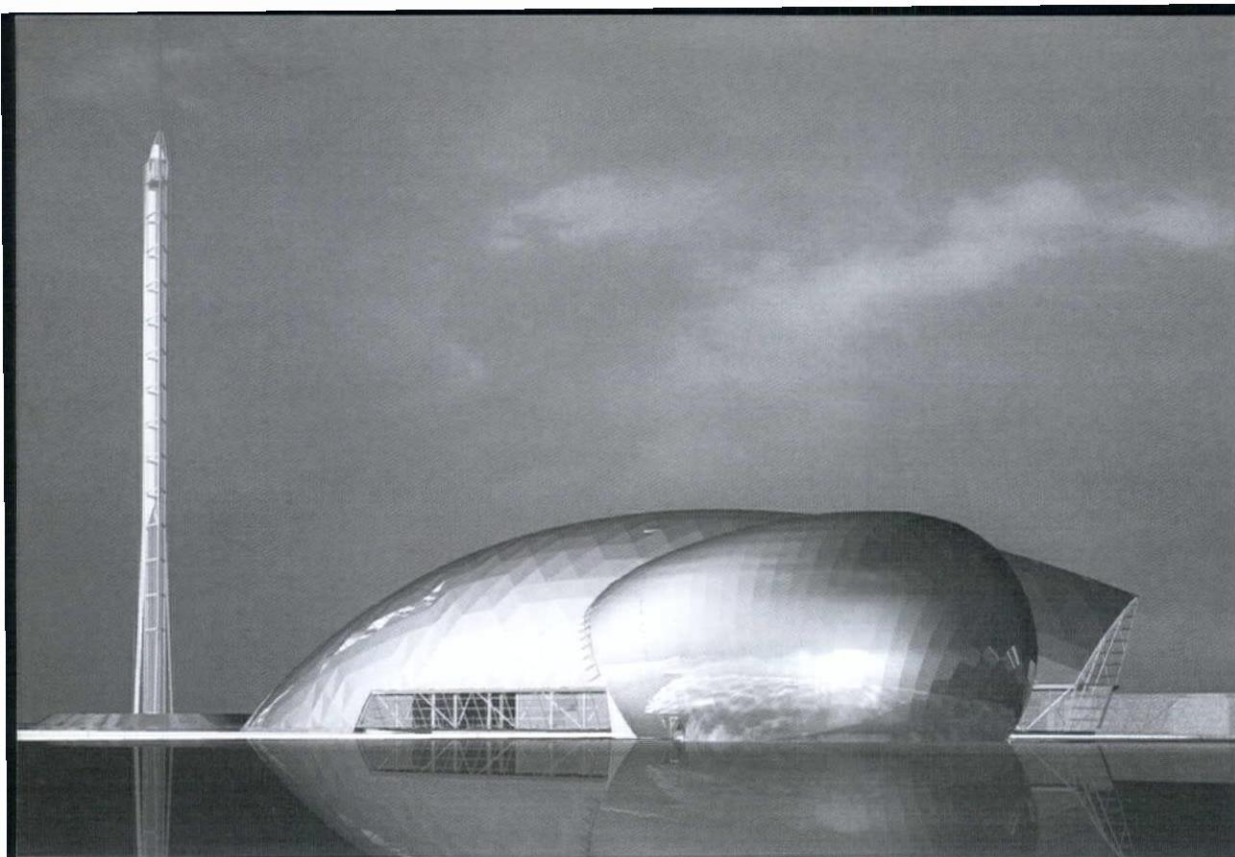
1 Apex of the site in foreground, with Abercorn Basin left and river right. Curved silver shield of Science Centre dominates complex from this angle.

2 From south, with main entrance signalled by flagpoles and canopies.

3 From the Abercorn Basin, with Arena left and Science Centre right. Red tiles of Arena are supposed to recall Belfast's Victorian brick: is silver cladding an echo of city's shipbuilding tradition?



ground level (scale approx 1:1850)



SCIENCE LESSON

On the banks of the Clyde in Glasgow, a new complex brings together cultural and exhibition elements to disseminate present and future scientific advances.

GLASGOW SCIENCE CENTRE
ARCHITECT
BDP

1 Computer-generated image showing the scheme's three components – Wing Tower, exhibition pod, IMAX cinema.

2 Exhibition pod is enclosed by a lightweight glazed roof, framing a waterside promenade.

3 The Wing Tower, which will be Glasgow's tallest structure, acts as a marker and beacon for the development.

In 1995 BDP won a national architectural competition to design the Glasgow Science Centre at Pacific Quay, a spit of land on the south bank of the River Clyde. The Centre aims to bring together scientific knowledge, existing technology and future developments, through a series of exhibition and cultural facilities.

The scheme consists of three discrete elements. The largest is a long, pod-shaped form housing an exhibition space, planetarium and two theatres, together with an assortment of cafés, shops, offices and workshops. Nuzzling one end of the huge pod is a 350-seat IMAX theatre (the first of its kind in Scotland), housed in an organically mutated dome-like structure. Pod and dome are linked to a glazed reception pavilion capped by an oversailing fabric roof. The third part of the triumvirate is the Wing Tower. Soaring 100m above the quay, the tower will be Glasgow's tallest structure and is designed to rotate gently according to wind direction, like a giant weather vane. Two glazed lifts transport visitors up from an

exhibition space in the tower's podium to an elevated cabin with spectacular citywide views.

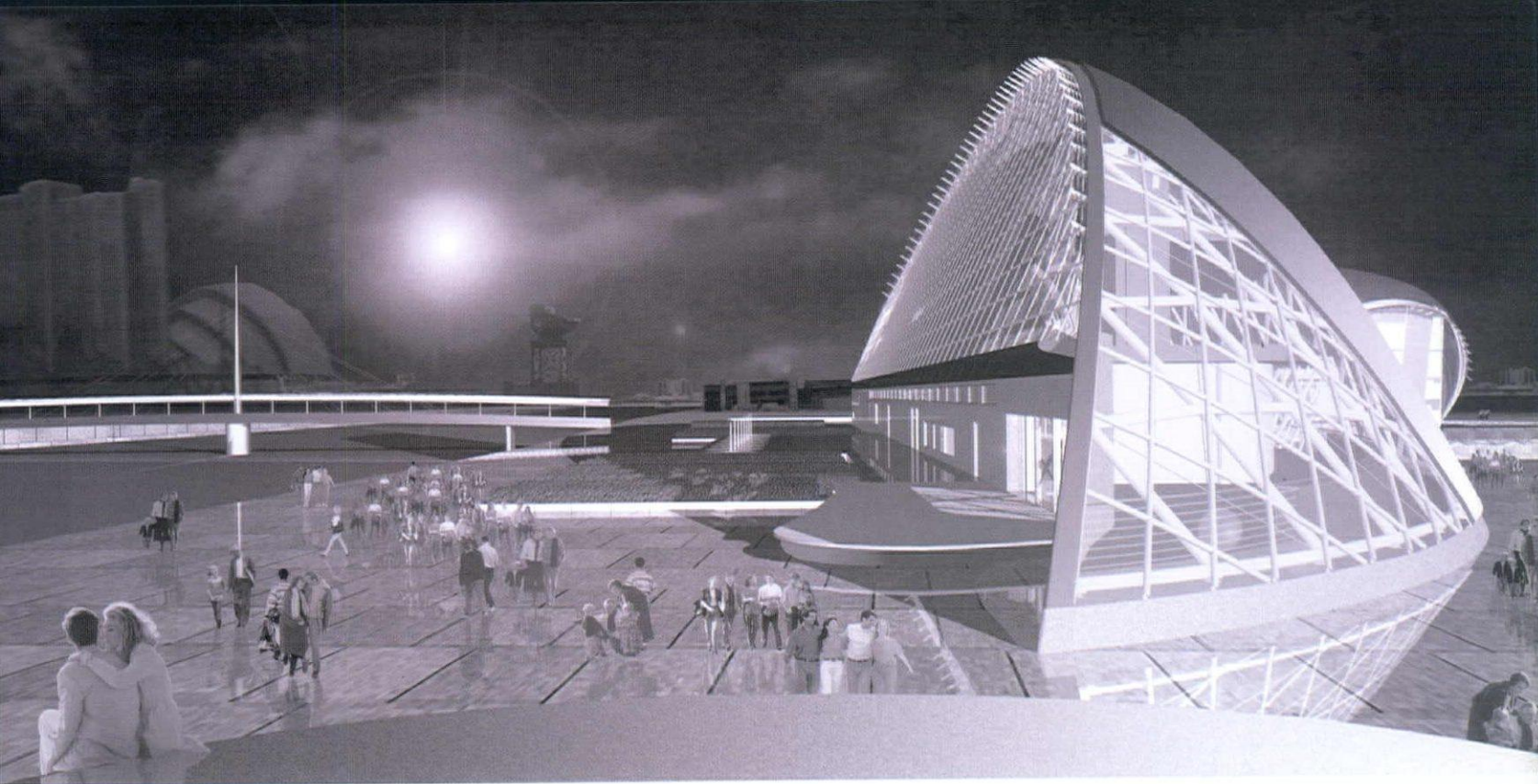
Through its inventive employment of materials, structure and services the entire centre forms a kind of 'super-exhibition', intended to illustrate the role of science and technology in buildings.

Environmental considerations encompass natural ventilation through the stack effect, a concrete structure to increase thermal mass and the use of river water as a cooling agent. There will also be provision for photovoltaic systems and a series of external exhibits that harness wind, solar and tidal energy, to disseminate the message of environmental responsibility. The Science Centre is one of the largest Millennium projects of its type and will form the hub of a network of similar centres in Scotland and beyond.

Architect
BDP

Architect for Wing Tower
Richard Horden Associates

Millennium Commission grant £35 000 000
Total project cost £71 500 000

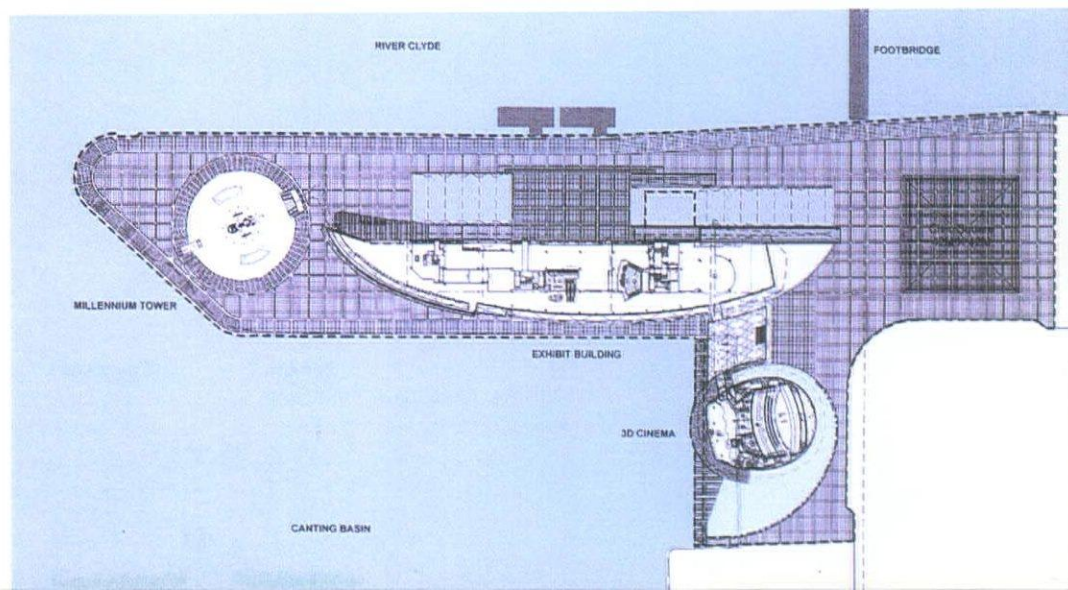


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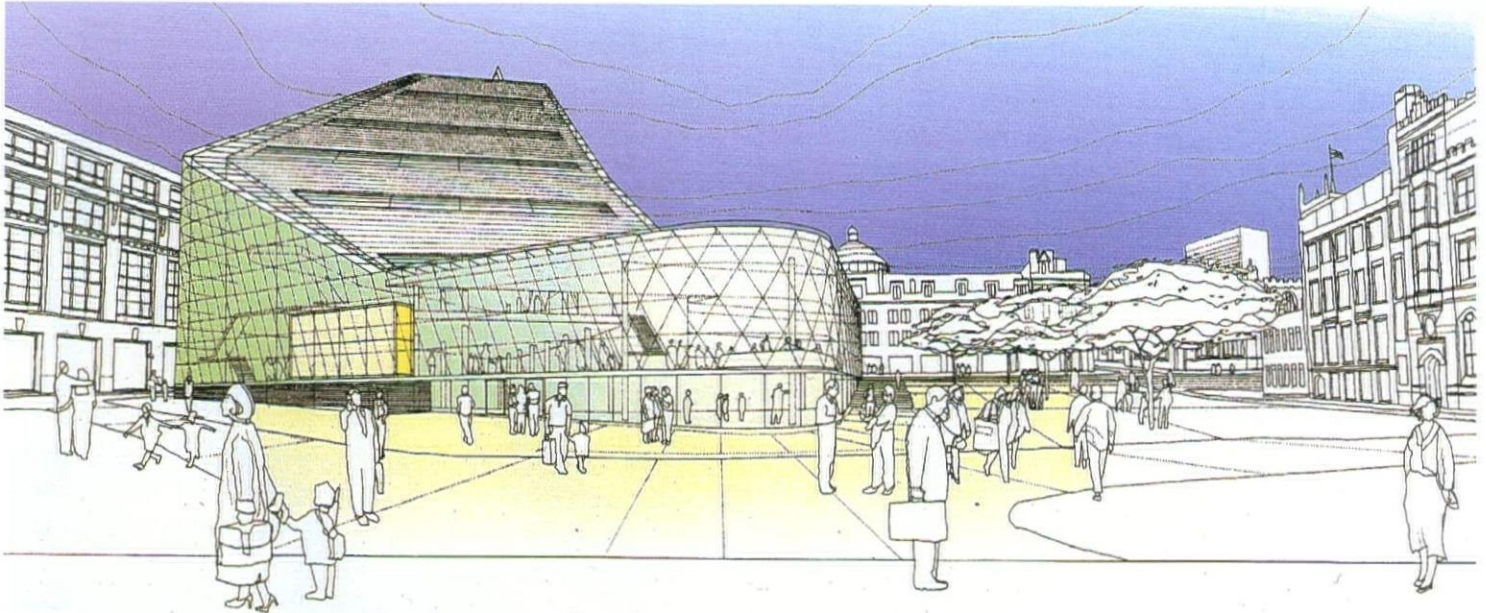
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site plan (scale approx 1:2000)

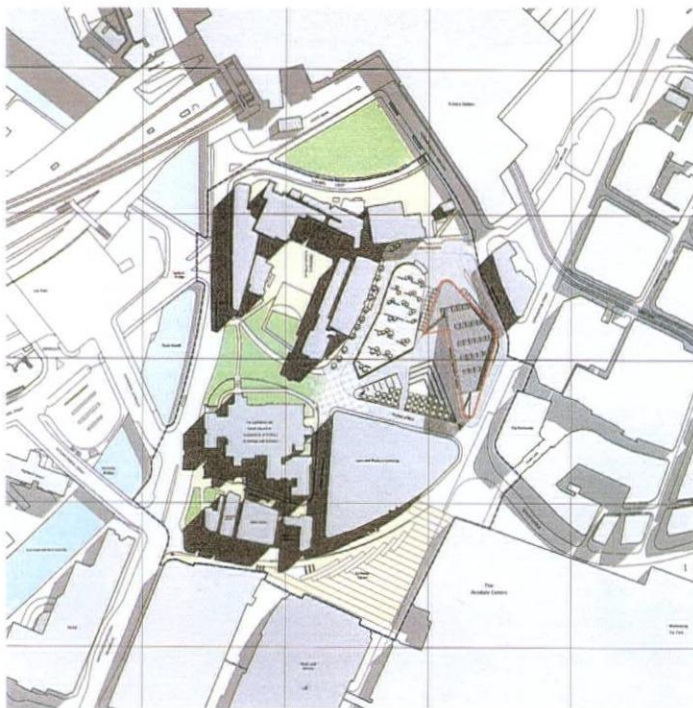


MANCHESTER METROPOLIS

Manchester's medieval core is the subject of a major urban regeneration project involving a new public square, various visitor attractions and Urbis, a centre for social history that examines the evolution of the modern city.



perspective showing urban context and new public square



location plan

In June 1996, part of Manchester was devastated by a terrorist bomb placed in a crowded shopping street. Out of the destruction and the rubble arose a new plan to revitalize the city centre. As this evolved, backed by huge private sector investment, the medieval core around the Cathedral and Chetham's School of Music became the focus of energetic planning for a distinctive millennium project. The plan for the Manchester Millennium Quarter includes a new public square (designed by Martha Schwartz), a visitors centre for Manchester Cathedral, a city park and Urbis, a new cultural attraction that explores people's experience of the modern city. In a landmark building designed by Ian Simpson Architects, Urbis charts the development of life in the modern city, from the starting point of Manchester, one of the first modern conurbations of the industrial age. It aims to unwind the common strands that unite cities and promote a better public understanding of the way in which cities have evolved in the

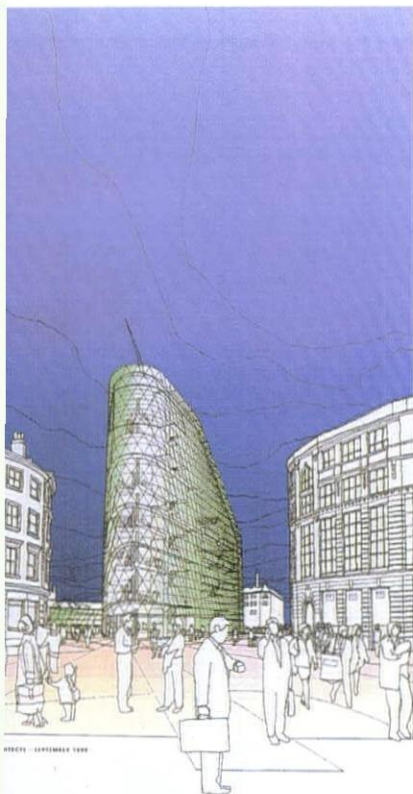
past and the issues affecting their future development. This will be done in a stimulating way that connects to people's experience of their own city and the way they live within it.

Urbis occupies an island site between the Corn Exchange and George Stephenson's Victoria Station. Based on a boomerang shaped plan, the new building steps down from a prow at its south end to embrace a new public space. The ground floor is given over to shops and cafés, threaded through with a glazed street, to encourage general daily use as a public concourse. Above are various gallery and exhibition spaces, diminishing in size as the building rises up to the south. Occupying the sixth floor prow is a bar and restaurant with impressive views over the city. These upper level spaces are linked to a ground floor foyer by a promenade staircase and a funicular lift. Circulation is simple and legible and the stream of visitors thronging through the exhibition areas will add to the animation of the more general public spaces.

URBIS, MANCHESTER

ARCHITECT

IAN SIMPSON ARCHITECTS



perspective of south elevation

The walls of the wedge-like form are clad entirely in a delicately translucent glass skin, so that the building is perceived as a series of elements encased within a shimmering membrane. Through different surface treatments, the skin reveals the general activity of its interior, while concealing the actual exhibits. Varying degrees of translucence give privacy where required, and around the gallery floors, panels of sandblasted and textured glass are used to control daylight into the galleries. A cascading roof of copper heightens the impression of organic amorphousness and marks out the building as a conspicuously contemporary addition to the fabric and life of the city.

Architect

Ian Simpson Architects, Manchester

Structural engineers

Martin Stockley Associates

Halcrow Waterman

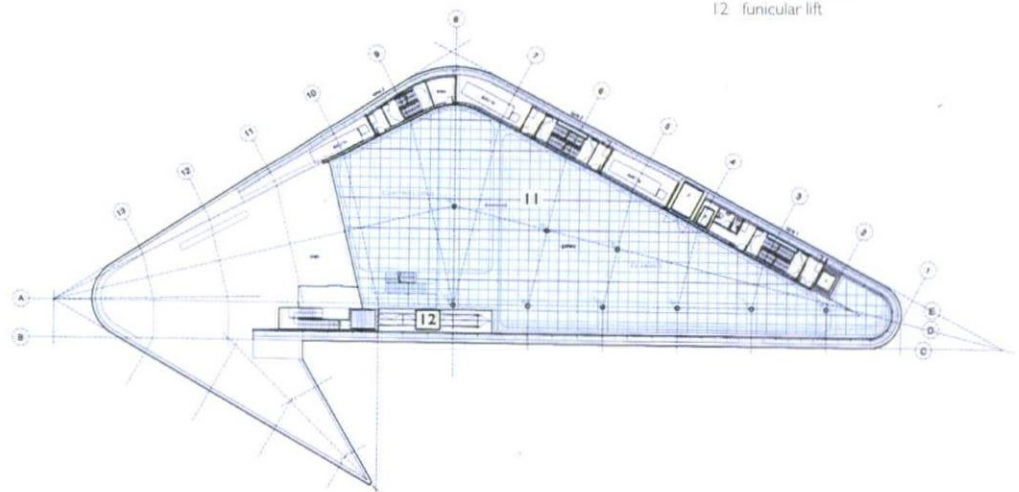
Environmental engineer

Farley McGrath

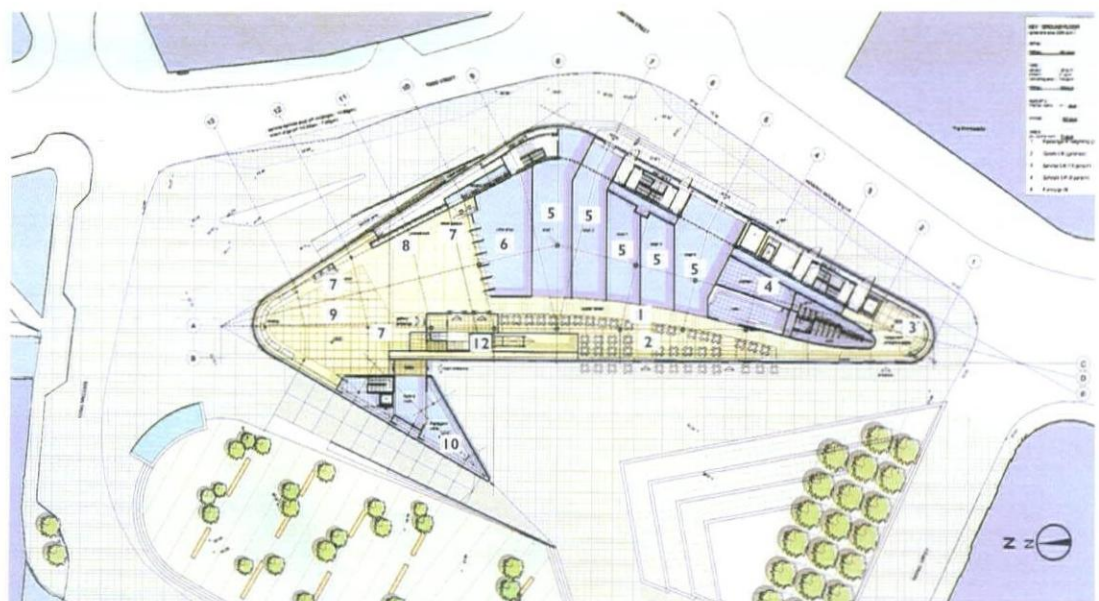
Millennium Commission grant £20 090 000

Total project cost £41 374 000

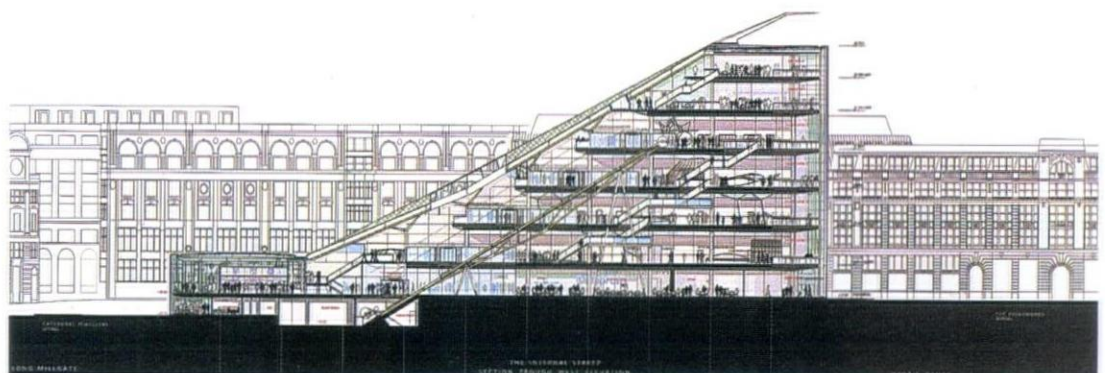
- 1 public street
- 2 café
- 3 restaurant entrance lobby
- 4 kitchen
- 5 shops
- 6 Urbis shop
- 7 ticket counter
- 8 wonderwall
- 9 foyer
- 10 manager's office
- 11 exhibition space
- 12 funicular lift



first floor plan



ground floor plan (scale approx 1:1000)



longitudinal section

SOWING THE FUTURE

The barrel-vaulted form of a major new seed bank for the Royal Botanical Gardens melds almost organically with the undulating Sussex landscape.

The Wellcome Trust Millennium Building, by Stanton Williams, is a new seed bank for the Royal Botanic Gardens of Kew. Due to be finished in the autumn, it is being built in the grounds of an offshoot of Kew: Wakehurst Place, Ardingly, Sussex. When completed, the building will hold the largest collection of seeds in the world, including the seeds of thousands of endangered plants.

The site in the High Weald is on a spur overlooking the Loder Valley in an area of outstanding natural beauty. Planning dictates were therefore strong. Responding to these and to the character of the wide-open, rolling landscape, the architects conceived a series of templates, simple vaulted buildings measuring 14.4m x 7.2m and linked by primary and secondary circulation routes.

All of the main process and research laboratories, and public areas, are above ground on one level, with the scientific buildings aligned east-west and disposed in two groups of six each side of a glazed winter garden. From within this area, the public will have direct views into the laboratories and be informed by video about scientific processes. North-west of these buildings is a sunken courtyard and research glasshouse. The courtyard is the focus for academic facilities and study bedrooms, providing a quiet collegiate atmosphere as well as private retreat for both staff and visiting scientists.

Seed storage requires sub-zero temperatures (seeds can be kept in a state of suspended animation for 200 years or more). Underneath the main block of laboratories, the seed bank here is a secure underground chamber kept at very low temperatures and the right humidity. Main materials are concrete, York stone, painted steel and structural glass panels. Fixing details are articulated in stainless steel. Concrete barrel-vaulted roofs over laboratories and fair-faced concrete walls provide the thermal mass necessary for the naturally ventilated laboratories. In contrast, a layered steel and glass barrel-vaulted roof is suspended between the scientific buildings to create the shaded public winter garden. P. M.

Architect

Stanton Williams

Service engineer

Pearce Buckle Partnership

Structural engineer

Michael Barclay Partnership

Millennium Commission grant £29 897 500

Total project cost £83 361 500

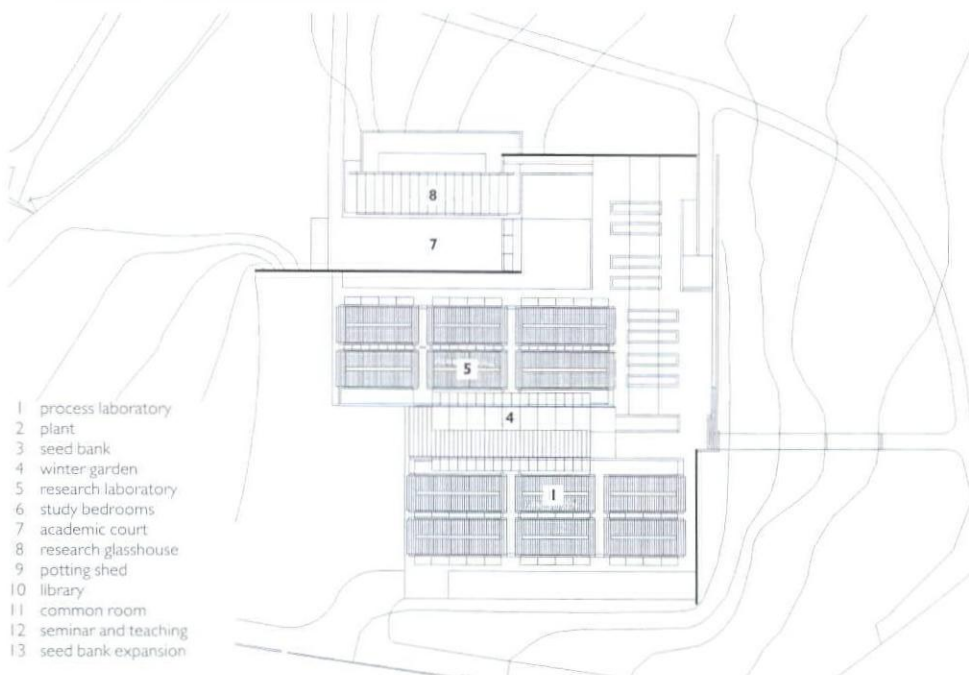


SEED BANK, WAKEHURST PLACE, ARDINGLY, SUSSEX

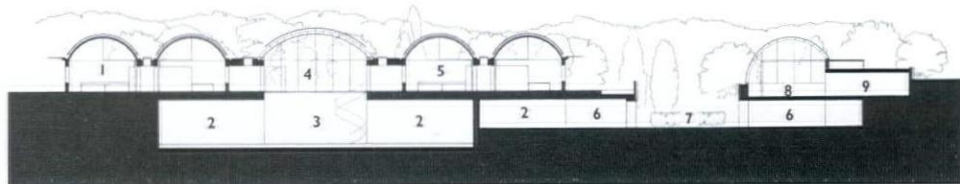
ARCHITECT

STANTON WILLIAMS

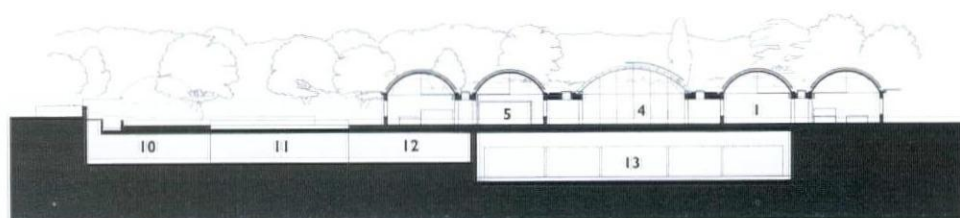
1 Model showing the barrel-vaulted forms in the gently rolling landscape.



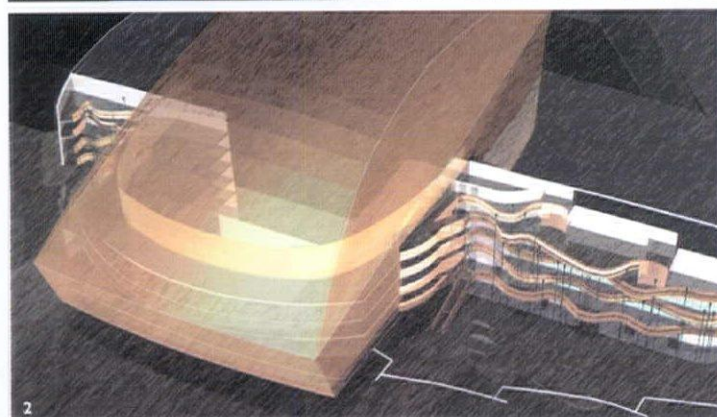
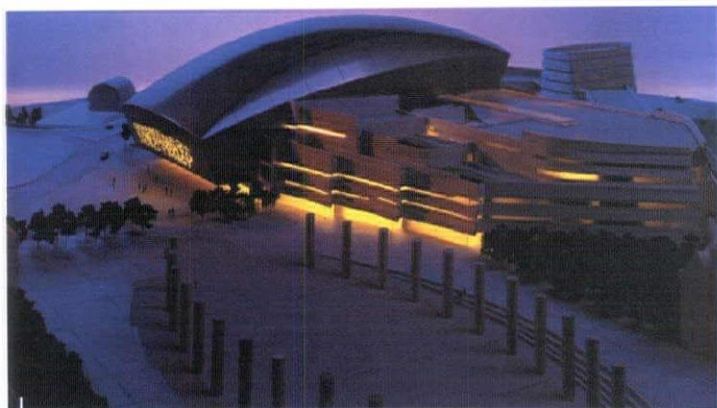
site plan



north-south cross section looking west

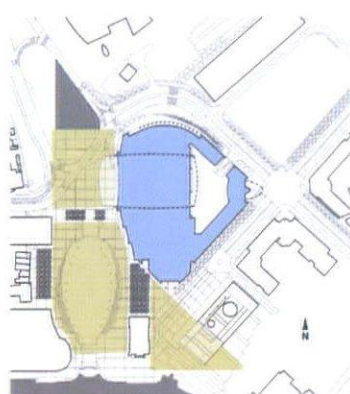


north-south cross section looking east



north-south section

- 1 South-west face onto Oval Basin Square, a new public space by Nicholas Hare and Cardiff Bay Development Corporation.
- 2 Stainless-steel hull embedded in stone faced base.
- 3 Main concourse with shops, bars, cafés for small scale performances and exhibitions.



site plan

WALES MILLENNIUM CENTRE,
CARDIFF, WALES
ARCHITECT
PERCY THOMAS PARTNERSHIP

BAY WATCH

In Cardiff, a new cultural centre will celebrate Wales' rich cultural heritage and will help to transform the dereliction of Cardiff Bay.

In Cardiff, the Wales' Millennium Centre, designed by the Percy Thomas Partnership, is presently taking shape on a large irregular site to the north of Richard Rogers' National Assembly, also under construction. When both buildings and associated landscaping are finished, the dereliction of Cardiff Bay will have been transformed.

The heart of the building is the lyric theatre which will seat about 1800 people. Equipped with the most sophisticated acoustic and lighting systems, it will be 'comparable to the best European theatres'. Foyers, auditorium and flytower are all enclosed in a single sculptural form, like an upturned hull, running west-east across the main north-south grain of the building. Covered with a skin of patinated stainless steel, it appears embedded in a horizontal stratum of stone, for the main faces of the building are constructed from slate waste in four colours from quarries in north and west Wales.

The theatre and the Centre's main tenant, the Welsh National Opera, share the building with smaller organizations connected with the arts, and with a hostel for the Urdd (Wales Youth Movement). These semi-autonomous units are linked by a series of shared internal and external spaces. The idea of a self-contained community is expressed by the enclosed character of the Centre so that it resembles a walled town with

distinct neighbourhoods. Arcades sweeping around the west side of the building, and concentrated around the south end, accommodate shops and restaurants and provide many public entrances. Above them are hospitality rooms and a stepped series of terraces with views to the bay.

A north-south axis along the line of the proscenium and partly traced by a scenery street (for moving stage sets from rehearsal rooms to stage) divides the building into front- and back-of-house. All public circulation areas, like the main concourse, are to the west of this line; the east side is devoted to the mechanics and organization of theatrical production. A large courtyard for up to a dozen lorries servicing the theatre and rehearsal rooms, deliveries and refuse collection, is entered off East Bute Street on the east side; it is surrounded by two arms of offices joined by a central tower marking East Bute's junction with Pier Head Street. Like the theatre shell, this structure has a stainless-steel envelope.

Architect

Percy Thomas Partnership, Cardiff

Project team

Rob Firman, Jonathan Adams, Keith Vince, Mike Dacey, Neil Shaughnessy, Paul Healy-Jones, Patrick Myall, Lee Griffiths, Lara Michael

Structural and services engineer

Ove Arup & Partners

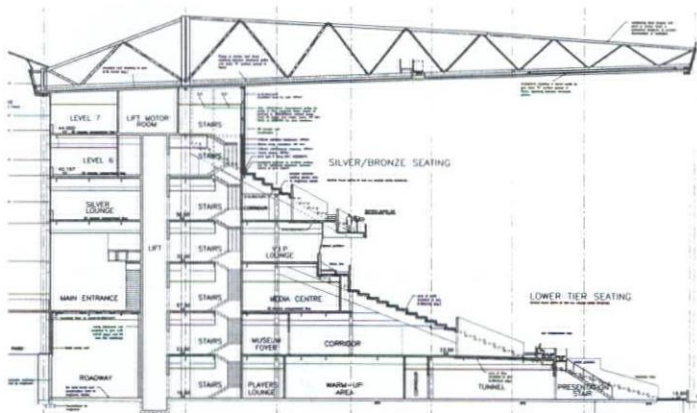
Theatre design consultants

Carr & Angier

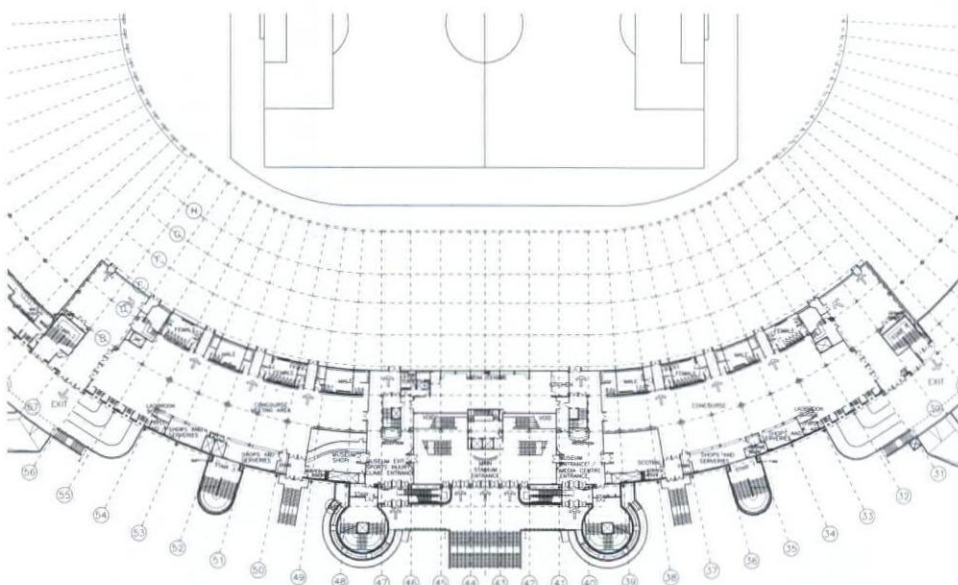
Millennium Commission grant £27 000 000
Total project cost £70 200 000

SCOTLAND DREAMS

A new stand completes the Scottish national football stadium to modern comfort and safety standards and makes it an international centre.



cross section through stand



entrance level (scale approx 1:2000)

- 1 Entrance (south) front, where new stand provides main entrance to whole stadium (framed between massive vomitoria drums).
- 2 New stand alone provides seats for 17 500 people and ensures that all are protected from elements.



Hampden is Scotland's national soccer stadium which has been redeveloped for the Millennium so that it can accommodate 52 000 fans under cover. The new work is in the south and west stands, where a 40m wide cantilevered roof has been created that connects to the existing ones, so covering a continuous symmetrical oval which rises toward the south to allow the new stand to be seven storeys high.

The original stands were partly cut into the slope, but on the south side, the full seven-storey height is revealed as a semi-independent building. Here is the nucleus of the complex. The main entrance is on the third floor, approached by grand stairs up from the car park (though there is another way of entering at level two, where escalators carry spectators to the upper of the two tiers of seating, which together provide seats for 17 500 people). The entrance is heraldically framed by the stubby rounded shapes of the vomitoria, clad in dark blue metal over red brick plinths.

A road runs through the bowels of the building at pitch level to deliver teams and VIPs to a special entrance. On the floor above is the Scottish Football Museum, and then above that the foyer, media centre and spectator concourses for the lower tier. Level four has a band of boxes and VIP lounges between the two tiers of seating. The fifth level has more hospitality spaces and the spectator concourse of the upper tier. Above are two levels of offices for Scottish football organizations. These, and the museum will be fitted out later this year, when 'Scotland's Field of Dreams' will be complete.

Architect

Percy Johnson-Marshall & Partners, Edinburgh

Consulting engineers

Hulley & Kirkwood, Babbie Group, Thorburn Colquhoun

Millennium Commission grant £23 000 000

Total project cost £60 600 000



MILLENNIUM STADIUM, CARDIFF, WALES

ARCHITECT

HOK + LOBB SPORTS ARCHITECTURE



WELSH NATIONAL TEMPLE

The Welsh national rugby centre has been rebuilt to new standards, and locked into the centre of Cardiff with new squares and a river walk.

1 New river walk along the Taff.

2 Over 72 000 spectators can be accommodated, all seated. Roof open, and ...

3 ... closing.

4 Loads are conveyed upwards by cable from crucial corners of roof, then back to ground from top of masts.



The Millennium Stadium encloses the holy turf of rugby, the Welsh national game. A 65 000 spectator stand was completed there in 1984 to the most up-to-date specifications, but 15 years later, it was out of date: consumer expectations that rugger should be watched sitting down and new, more stringent safety standards had reduced the capacity of the place to 53 500 – and even then 8000 people had to stand. The Millennium bonanza offered the opportunity of building a completely new stadium which could be used for other functions besides rugby: soccer, religious festivals and concerts for instance. (To achieve the huge project, Wales decided to scrap proposals for the Cardiff Opera House designed by Zaha Hadid, so that nation and the city could pour their energies into what Welsh people really revere).

Hadid's controversial design may have had many virtues, but response to the cold, rainy, grey-lit climate of Cardiff was not one of them. The Millennium Stadium avoids climatic crassness by being the first one in the UK to have a roof that can be completely closable over the pitch. It accommodates 72 500 spectators, all of whom are seated. HOK + LOBB were appointed as architects

in 1995 and developed the proposal on the original site with a change of orientation. The city centre location was retained not only for sentimental reasons, but because the institution generates large sums for local businesses and it is easily accessible from local bus and rail stations, a factor found to contribute to success of new stadiums in the Antipodes. There is a new public walkway along the river Taff, and new urban squares (by other architects) are being created to lock the huge structure into the fabric of the inner city. It changes colour as it ascends: the lowest levels are green and blue; at the top red and plum panels line the overhang, while the roof is silver.

Within this coat of many colours are four main levels of activity – two underground levels are devoted to car parking, services and players' changing rooms (the design of stadiums has not changed much since the Colosseum). Above ground, the first level has 25 000 seats, bars, shops and restaurants. On the second level 15 000 seats are given over to VIPs, and the third has hospitality boxes and restaurants. Level six has 32 000 seats for less grand people.

The most interesting parts of the building

are the pitch and the roof. Because the grass is heavily overshadowed by the enclosure it is planted on 7400 pallets, each weighing about half a tonne; they are regularly rotated to ensure that each piece of turf gets its time in the sun. The roof's tubular steel structure has two primary trusses 220m long which flank the main axis of the pitch. Secondary trusses define the short ends of the pitch, and loads from the crucial points of connection between primary and secondary trusses are taken up by pre-tensioned cables, transferred to tall masts in each corner of the building, and then back to ground. Movable parts of the roof span 76m and roll along tracks supported on the primary trusses. On each side, five units 11m wide and 7m deep can be moved out to ensure that the great game will never be interrupted by the Celtic climate.

Architect

HOK + LOBB Sports Architecture

Structural engineer

W. S. Atkins

Mechanical and electrical engineer

Hoare Lea & Partners

Millennium Commission grant £46 000 000

Total project cost £138 823 914

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Internet: www.sps.it • e-mail: info@sp.it

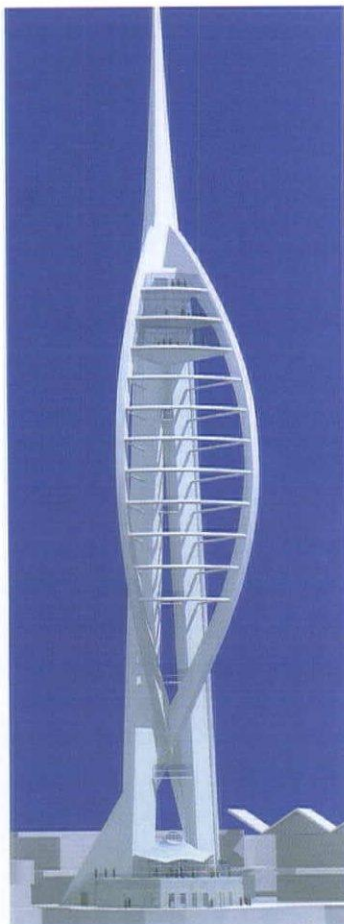


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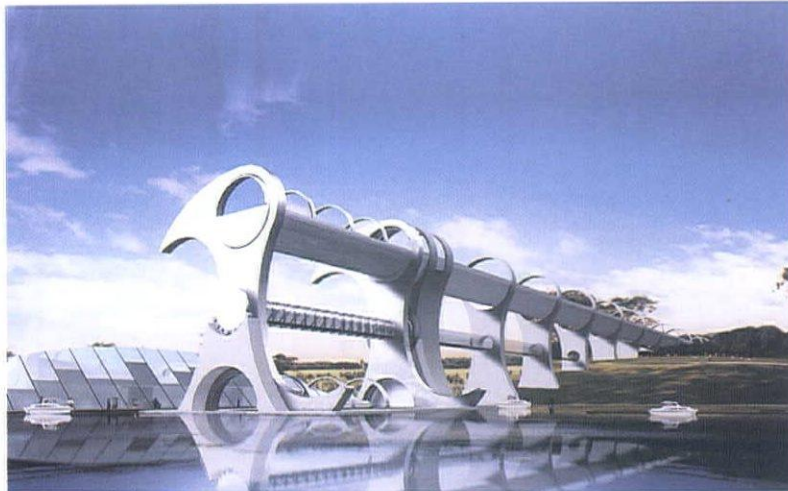
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1

1 HGP Greentree Allchurch Evans: observation tower Portsmouth Harbour Renaissance project.



2

2 RMJM with Ove Arup & Partners: rotating boat lift near Falkirk – a techno sculpt which will help revive the Forth-Clyde canal and replace a flight of nineteenth-century locks.

Four of the major Millennium schemes are impossible to illustrate in the normal way: the national cycle network, the University of the Highlands and Islands, the Renaissance of Portsmouth Harbour and the Millennium Link – the re-opening of the canal between Edinburgh and Glasgow. Like the cycle network, the other three projects are largely concerned with improvement of existing things and linking them to become part of the infrastructure: they will perhaps have more impact on community than many of the individual set-piece buildings shown elsewhere in this issue.

The University of the Highlands and Islands draws together scattered teaching institutions throughout the romantically deserted Celtic north-western fifth of Britain by making a coherent infrastructure, improving 17 buildings and generally making sure that all is linked up electronically from the North Atlantic Fisheries College in Shetland to the Highland Theological Institute near Inverness, from the Lewes Castle College in the Outer Hebrides to the Dunstaffnage Marine Laboratory in Argyll. It intends to be a world-class tertiary education organization by 2001.

Portsmouth's great natural harbour has been important since Roman times and, at the height of Empire, it was the Royal Navy's greatest base. Since then, the Forces and the city have run down, particularly since the collapse of the Soviet Union. Large amounts of land have become available for development, and many of the wonderful austere and elegant eighteenth and nineteenth century naval buildings, the barracks, docks and storehouses, need new uses.

The Navy continues to have a smaller up-to-date base in the harbour area, but suddenly large areas of previously inaccessible city have become open. The Renaissance of Portsmouth Harbour Millennium project is intended to connect all the different parts of ex-Navy land and integrate them into a new kind of city based on aspects of the new economy, particularly tourism, leisure, heritage and shopping. Portsmouth certainly has world class monuments: as well as the buildings, two of them float – HMS Victory, Nelson's flagship at

Trafalgar and HMS Warrior, the world's first armoured iron battleship.

And it has always been a city divided in half by the harbour itself, with Portsmouth on the east side and Gosport on the west. Links between all the disparate bits are to be provided on land by hard landscaped promenades and over the harbour by a waterbus network. For locals, a submarine light rapid transit system between Portsmouth and Gosport will probably be more useful (it is not part of the Millennium scheme). The most obvious Millennium contribution will be the new Calatrava-esque observation tower by HGP Greentree Allchurch Evans, erected at a key point in the urban texture to give a symbol for the revived city, and views of the whole harbour.

Re-opening the canal system between the Forth and the Clyde is an ingenious, picturesque, nostalgic notion. Now to be used almost entirely for pleasure craft (though not exclusively), in the eighteenth century it was the industrial artery of Scotland. It was much destroyed in the horrendous 1960s, when motorway schemes and simple stupidity broke it into dead stretches of water. They are being linked again with great ingenuity, the most dramatic example of which is the quite extraordinary rotating boat lift at Falkirk which is to hoist barges up over a difference in level which was formerly dealt with by a flight of nineteenth-century locks that were closed in the 1930s. It is to be a remarkable and extraordinary engine – and clearly the huge techno-sculpt (designed by RMJM and Ove Arup & Partners) is the proper structure with which to end this special issue of the AR. P.D.

delight



Jeremy Young/GMJ



Hayes Davidson/Jeremy Young

ONE OF THE MOST ELEGANT AND DRAMATIC OF THE SMALL WORKS SUPPORTED BY THE MILLENNIUM COMMISSION, THIS NEW PEDESTRIAN BRIDGE LINKING THE CITY AND SOUTHWARK WILL HAVE A MAJOR EFFECT ON LONDON.

Since Wordsworth stood on Westminster Bridge one sunny morning in the dawn of the nineteenth century, looked towards St Paul's Cathedral and declared 'earth has not anything to show more fair', the Thames has not been lucky. Delicately scaled Georgian buildings were replaced by Victorian and even more gross modern hulks, coarse utilitarian rail bridges crashed across the water, and, for all the well meaning '50s and '60s attempts to improve the South Bank, the river has become one of the least impressive in any European capital. Now, again, there are attempts to make it the proper and dignified main artery of Europe's greatest city. Among the new initiatives, two of the most impressive promise to be bridges, the first crossings in the centre since Tower Bridge in 1894.

The Millennium Bridge is intended to be complete in June. In a dramatic gesture, it links the City, and Wren's great cathedral with Southwark, where Giles Gilbert Scott's massive Bankside power station has been converted into Tate Modern by Herzog & de Meuron (p54). For pedestrians only, the bridge will make a hitherto

unimaginable connection between two sides of the capital that have often seemed to be separate cities. It is funded by the Millennium Commission (though not to the extent of being one of the 25 projects shown elsewhere in this issue).

Designed by Foster & Partners, sculptor Anthony Caro and engineers Ove Arup & Partners, the simplicity of the span belies its complex generation. Light loadings allow it to become a very gentle curve supported on pre-stressed cables anchored on each side and propped by two slender Y-shaped concrete piers, elliptical in section. Ten or 20 years ago, such a structure would have been all advertisement: proud erections of masts and cables emphasizing their functions. Five years ago, in the wrong hands, it could have had the dumb aggressive dullness of cable-staying. Now, it promises to be as light as a leaf, with structure and cast aluminium deck integrated as far as possible and swooping over the water, illuminated at night by continuous fibre optics to make a delicate luminous suture between the two halves of the severed city. P.D.