

# Christ Church Library

Mathematical instruments and architectural  
space in 18th-century Oxford

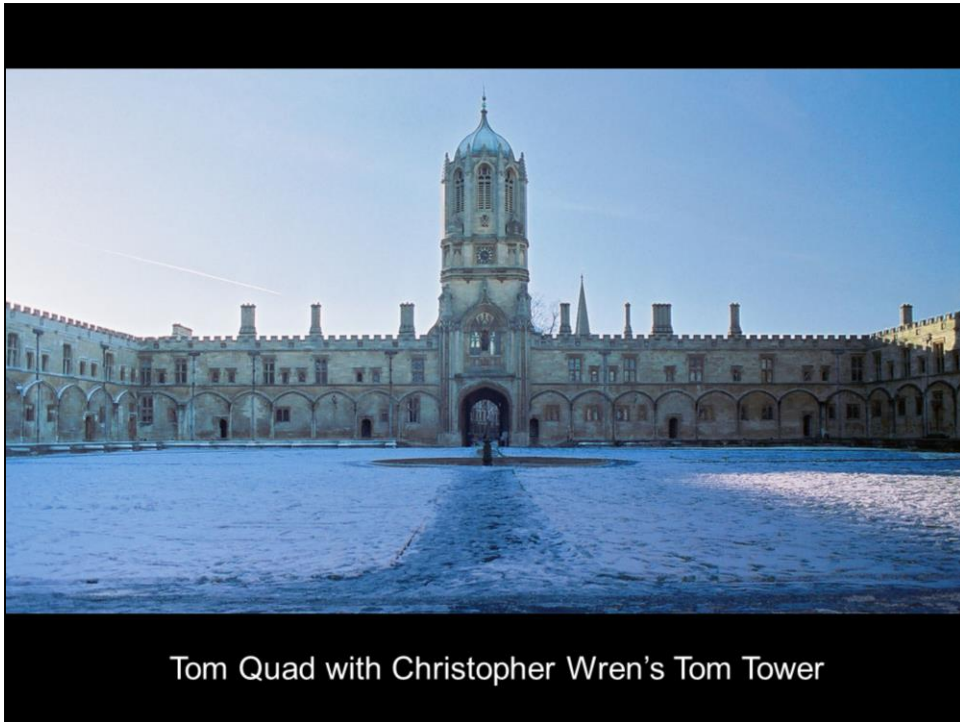
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History of Science  
University of Oxford



Christ Church is one of Oxford's colleges. You might think that a paper on an Oxford college library of the 18th century will be a rather low key and parochial affair. And why Christ Church rather than any other college? Because Christ Church is a special case - at least, it certainly thought itself to be special (and, it might be added, still does....).



Tom Quad with Christopher Wren's Tom Tower

The college was founded on a grand scale by Cardinal Wolsey in the early 16th century and refounded by Henry VIII 20 years later.



The 12th-century cathedral was originally the church of St Frideswide's priory

It has the distinction of being the home of Oxford's cathedral – Henry VIII made the College Chapel double as the base for the Bishop of Oxford.

From the later 17th century onwards the college was particularly successful in drawing aristocratic students. Its alumni include innumerable Prime Ministers, Viceroy and other figures of the British establishment and empire. To create appropriately grand accommodation for these socially elevated students, the college was one of the pioneers of classical style in Oxford architecture.



Peckwater Quad, constructed 1707-14

The three sides of Peckwater were begun in 1707 under the administrative and architectural leadership of the college's head, Dean Henry Aldrich, whose intention was to complete the quadrangle with an architecturally distinctive free-standing block of student rooms.



Peckwater Quad, with Henry Aldrich's design for a free-standing southern side

Aldrich died in 1710 before the plan could be put into effect.

“In our new building, we shall observe Dr Aldrich’s model as to the case, but we design to turn the inside into a library, and to make it the finest library that belongs to any society in Europe.”

Dr Stratford to Edward Harley, 1716

When the project was taken up a few years later the purpose of the building was transformed. Now it was to become a new library – and not just any library. It was intended from the outset to be “a splendid building deliberately designed to rival, and indeed surpass, other great academic libraries of the age such as those of Trinity College, Dublin, Trinity College, Cambridge, and All Souls College in Oxford” (Cook and Mason).



Christ Church Library

Aldrich's design was revised somewhat to produce the form that survives today. The building project was an extended one, beginning in 1717 and continuing as funds allowed. The roof was completed 1738-42 and the interior decoration carried out in the 1750s, while outfitting was still going on in the 1760s.

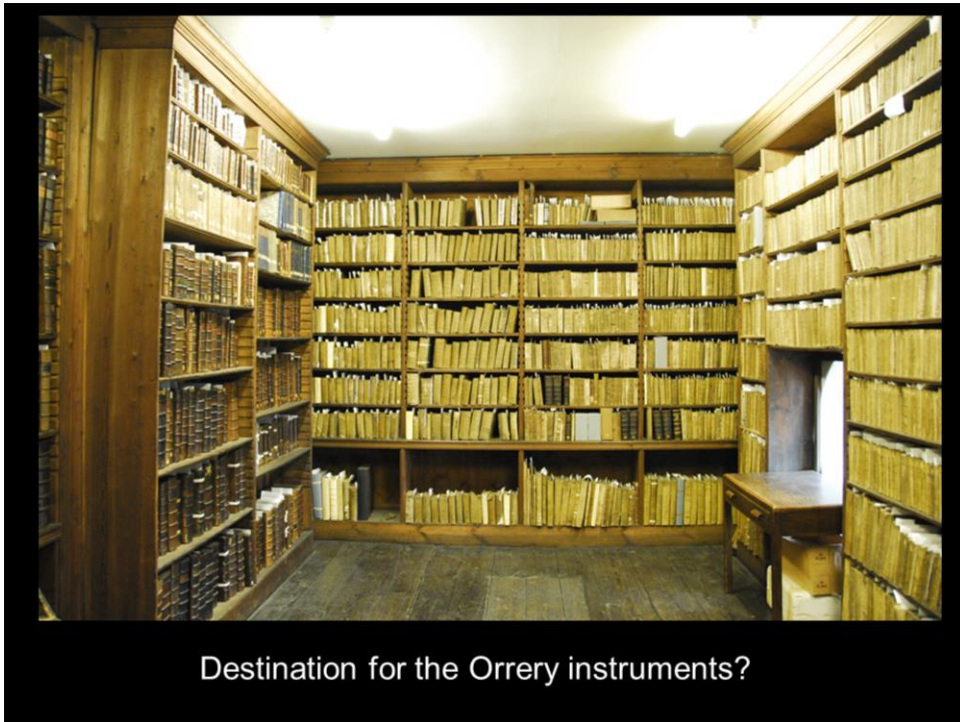
So here was a self-consciously grand attempt to create a major architectural space for learning. How do instruments inform this space?





The new building finally provided a permanent location for the library of the Earl of Orrery (of orrery fame) which had been bequeathed to the college on his death in 1731. Orrery's books are still in Christ Church and his name is centrally placed on the bookcase in the gallery in the reading room.





Destination for the Orrery instruments?

But he also bequeathed his collection of instruments. The Earl's will had actually stipulated that his books and instruments were 'to be kept in a separate room for the use of students'. In 1763 the instruments, which had been temporarily housed in the college since 1732, were at last transferred to special library rooms.



Orrery collection:  
Armillary sphere by  
John Rowley

What was to be found there?

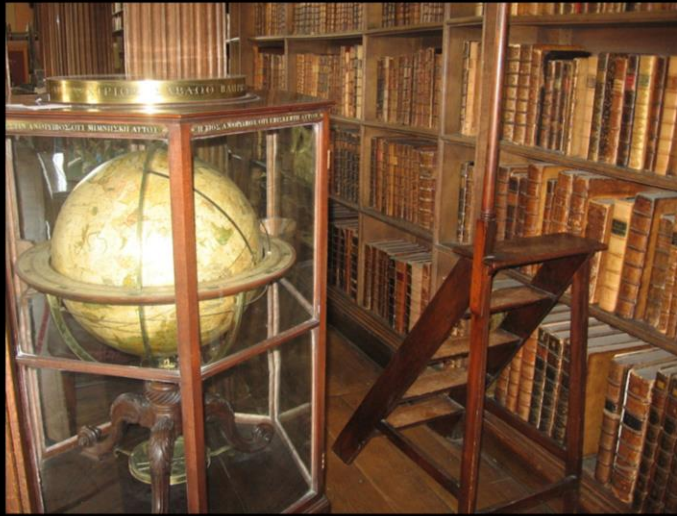


Orrery collection: Sutton quadrant



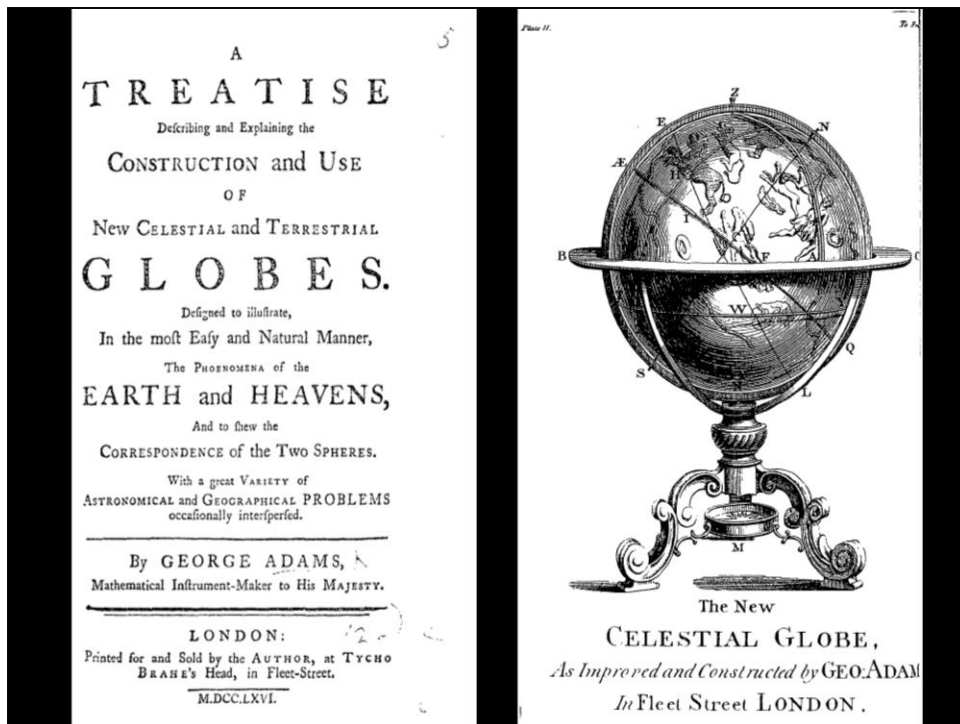
Orrery collection? Sector by John Rowley

So instruments were embedded as part of the learned apparatus of the library, though seemingly in a separate room. These instruments are now in the Museum of the History of Science, but others are still in Christ Church and with a much more visible presence in the main library space.



Celestial globe by George Adams sr, 1760s

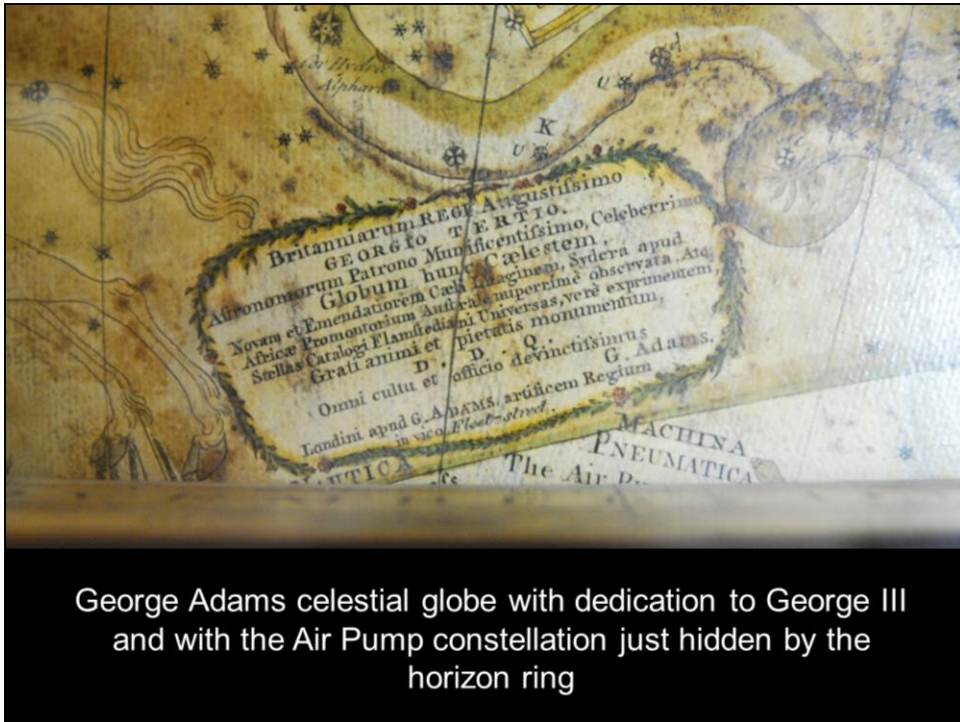
Flanking the entrance into the huge space of the library are a pair of globes by George Adams senior.



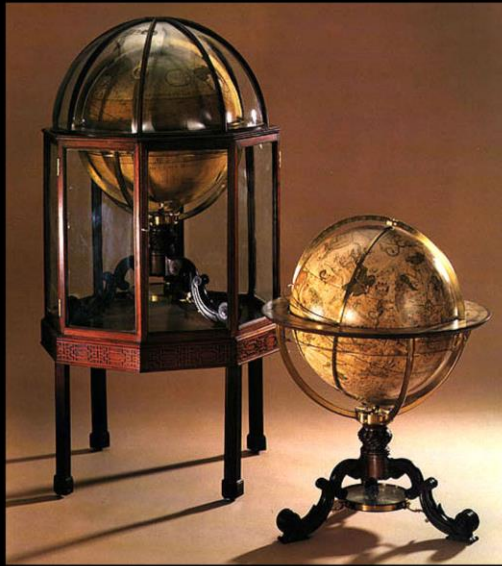
These are the new pattern that Adams described in 1766 and which was to be vigorously attacked by Adams' commercial rival Benjamin Martin shortly afterwards.





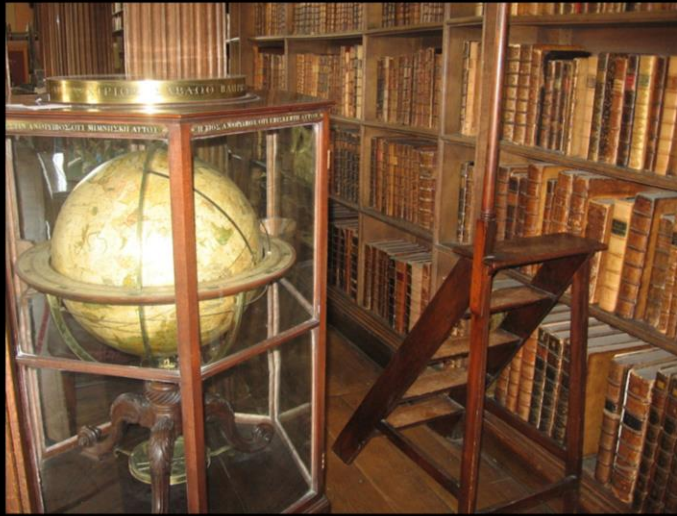


Adams was instrument maker to the King and his book and the globes themselves were dedicated to George III. No record has so far been found in the college archives of how and when these globes were acquired. There were already sets of globes recorded in the Old Library in the 17th century. Surely this new set was purchased in the 1760s, when it would have been an apt ornament for the new library as it finally approached completion. Adams' claims to improvement and accuracy, as well as his official position as royal instrument maker, would have recommended his set to this most status-conscious of colleges.



George Adams  
globes from the  
George III  
collection,  
Science Museum  
London

The globes were certainly provided with elaborate furniture. Here are George III's own pair, with one of them in its fine octagonal case.



Celestial globe by George Adams sr, 1760s

The Christ Church pair are also preserved by original and apparently unique hexagonal cases, cases which have not only a material protective function but also a didactic and symbolic role.



The brass drum inscription is taken from Isaiah c.6 v.3:  
 And one cried unto another, and said, Holy, holy, holy, is  
 the Lord of hosts: the whole earth is full of his glory.

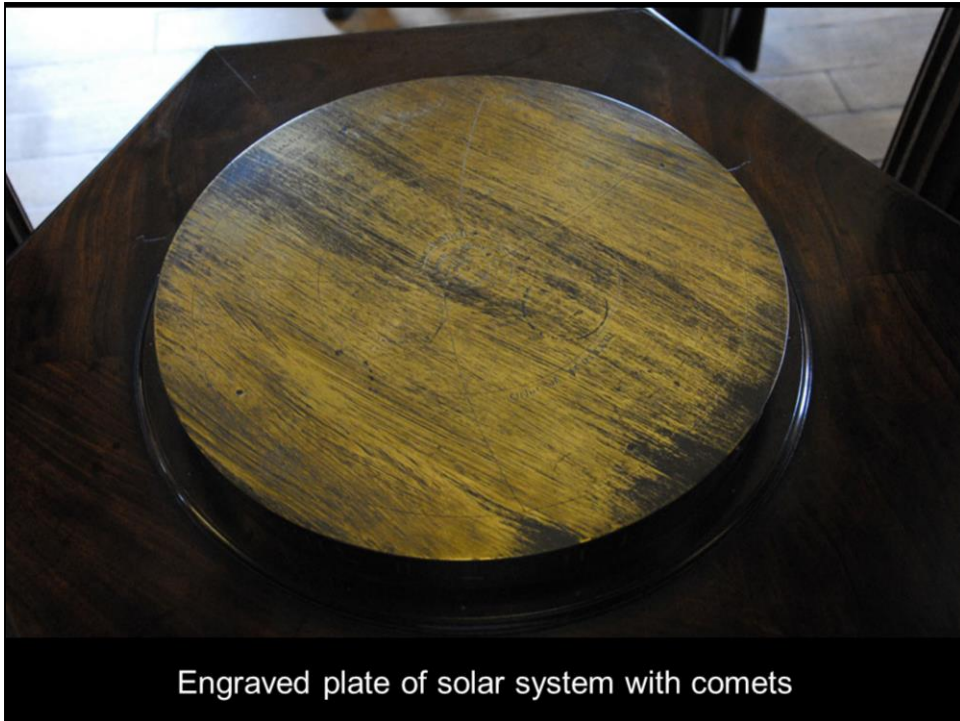
On top of each case is a brass drum with a biblical inscription in Greek around its edge. On a sequence of brass strips around the top of the hexagonal frame is another Greek biblical inscription.



Each case is signed by Adams as  
"Instrument Maker to His Majesty K G III"

At the bottom of each case is Adams' signature: there can be no doubt that the globes were originally supplied with these cases.





Engraved plate of solar system with comets

The biblical quotes around the case frames and the top drums are conventional and appropriate for a college whose Latin name *Aedes Christi* is literally The House of Christ. But don't jump to the tempting conclusion that the cases provide a religious wrapper for the authority of nature which they contain and mediate. For the cases also display the order of nature.

The top of each brass drum is engraved with an astronomical scene – the solar system on one and the annual cycle of the sun and seasons on the other. In a sense the cases are themselves instruments, ones which are designed to complement and enhance the globes that they protect by demonstrating both piety and learning.







These hitherto-unrecorded astronomical plates make the pair of globes unique.



Library of El Escorial with armillary sphere made for Philip II by Antonio Santucci, Florence, 1582

But it should be acknowledged that, up to this point, Christ Church is a good example of a well-known pattern, rather than an especially novel setting: globes and instruments were familiar features in other early modern libraries. Paul Lawrence Rose has noted that, as early as the 15th century, "Leon Battista Alberti had followed classical practice in recommending the installation of a planetarium or astronomical clock in the ideal library and spheres were a common feature of the Renaissance collection".

## Bodleian instruments



Armillary sphere presented  
by Sir Josias Bodley



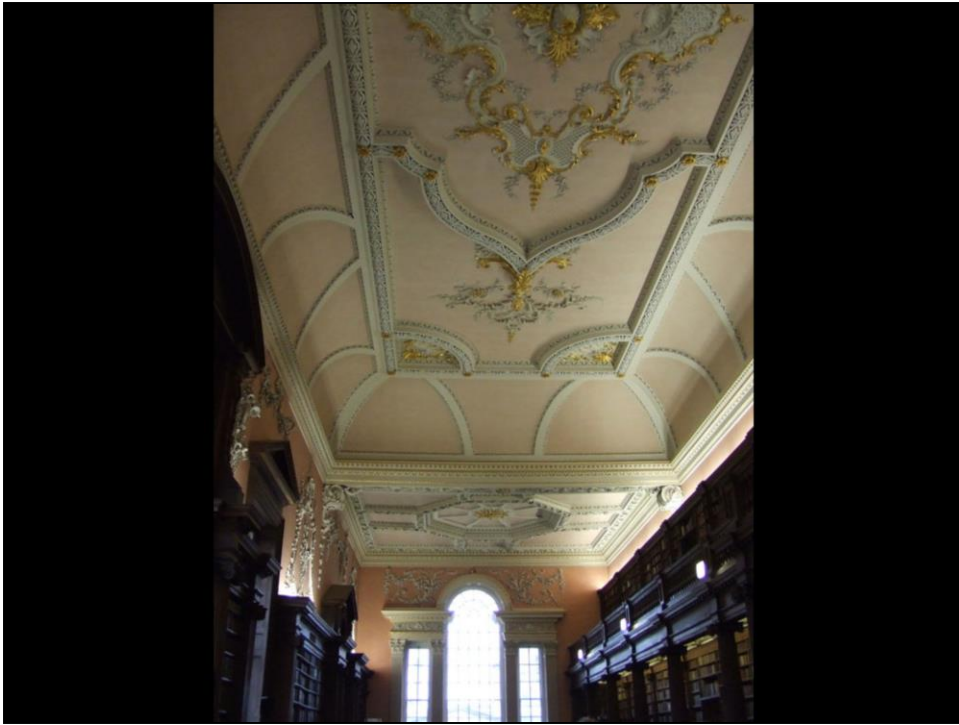
Geometrical square by  
Christoph Schissler

17th and 18th century Oxford certainly followed this precedent, not only in college libraries contemporary with Christ Church but also in the university's Bodleian Library.



Christ Church Library interior in the early 19th century

If the inclusion of mathematical instruments and globes was a familiar way to equip a library, Christ Church nevertheless went one better than normal practice by incorporating instruments into the physical structure of the building.



The library interior was decorated in the early 1750s and one of the major elements was the plasterwork carried out by the noted Oxford craftsman Thomas Roberts.



As well as the ceiling he executed some extraordinary high-relief “trophyes” on the walls between the windows and above the bookcases.









(Look again! It's not the same feature as in the previous image.)



Telescope  
Equinoctial ring dial

Square  
Scoliotic ball

Sector  
Telescope  
Gunner's quadrant  
Builder's level  
Mason's compasses

Cross staff

Mariner's astrolabe

There is an amazing realism to these depictions of mathematical, optical and building tools. It's impossible not to have the strong sense that what we are seeing are simply white-washed instruments fixed up on the wall. But such work was typically modelled or sculpted in situ using fingers and small tools, although for such high relief decoration, it may have been necessary to build out the work around an armature of wire, wood or nails.

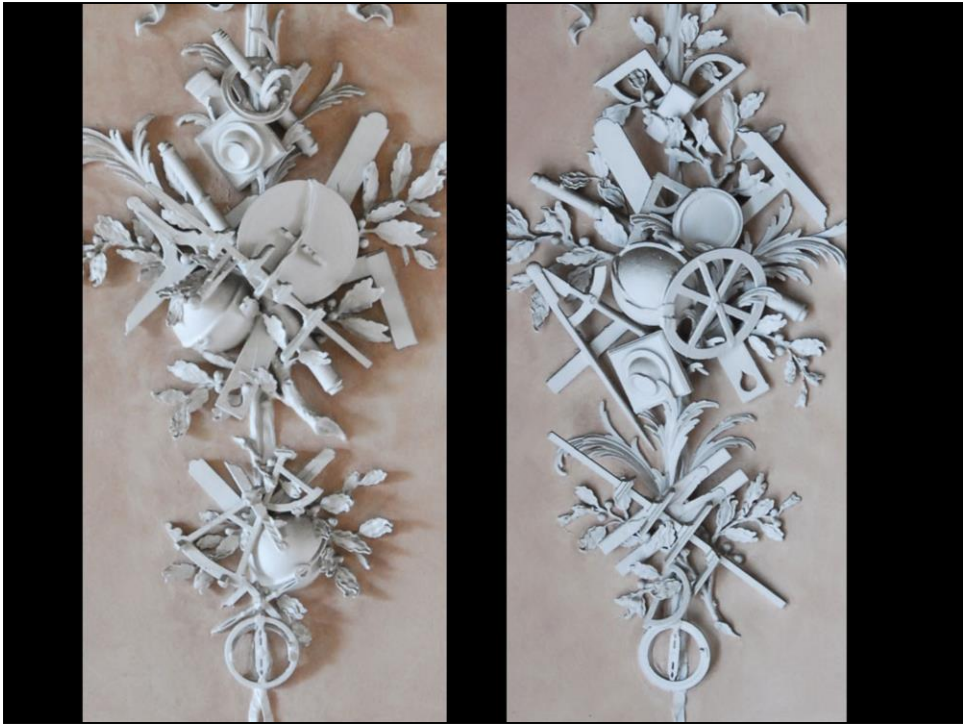


Nocturnal

Parallel ruler

Compasses  
Protractor  
Square

There are five of these mathematical trophies, all closely related but rearranging a similar repertoire of instruments. Who can doubt that we are witnessing the instrumental shaping of the library space?







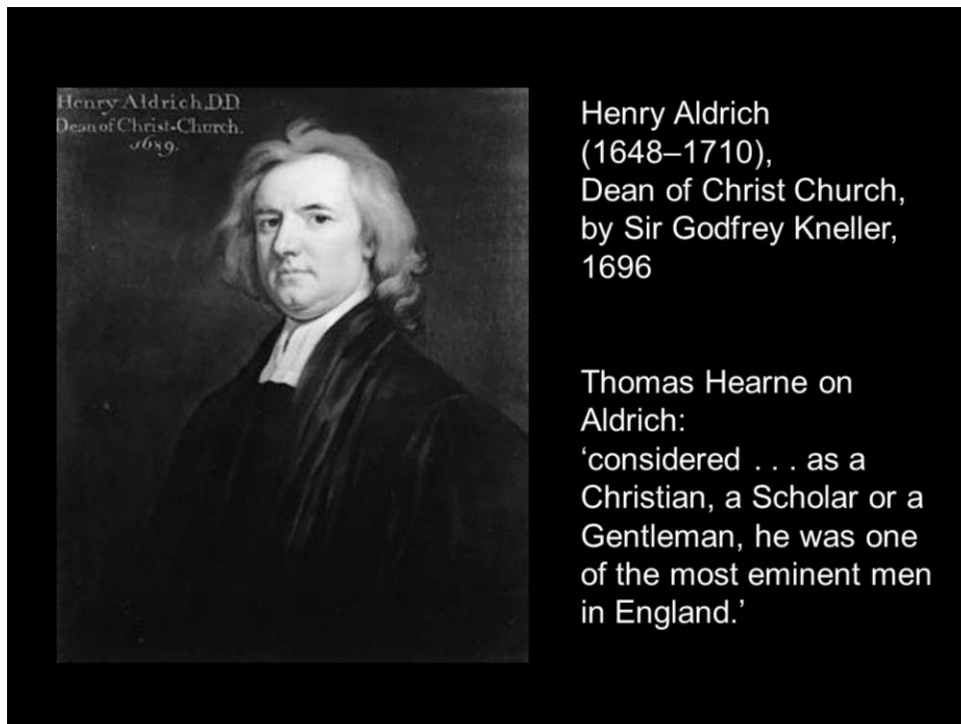


What are they doing here? Why was this strongly mathematical programme settled on? The best clue comes from the presence of two other trophies that are not mathematical.



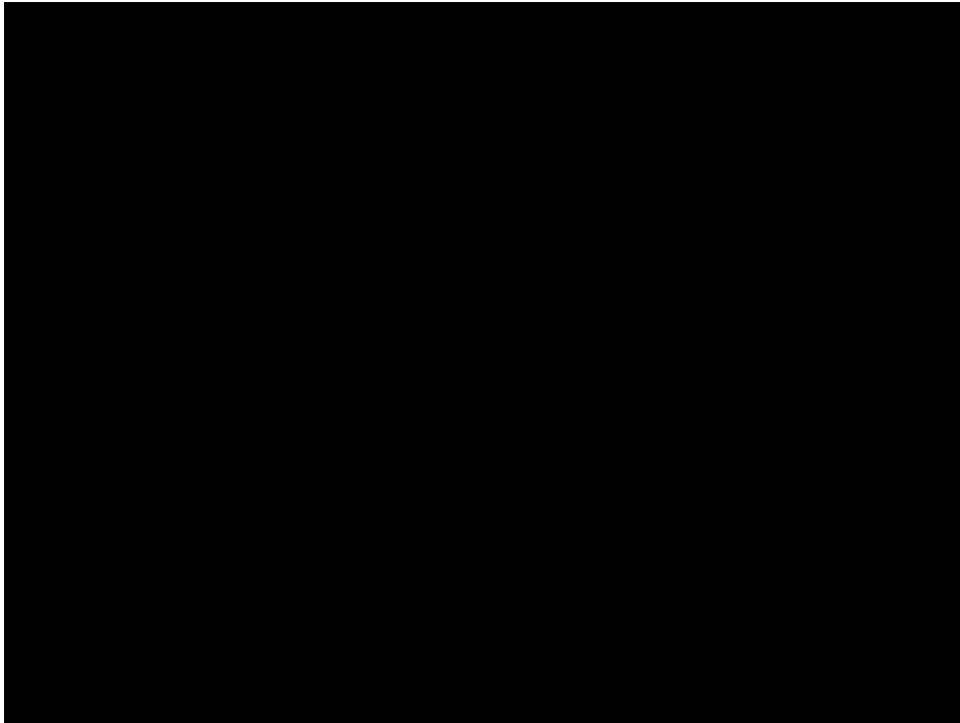
The combination of musical and mathematical instruments, along with the role of Dean Aldrich in planning the building, strongly suggests that these instrumental plasterworks were meant to conjure up his memory.





Architecture, music and mathematics were key scholarly and practical interests of Aldrich, who was Dean of Christ Church from 1689 to 1710. He wrote on and practised architecture; he collected architectural prints and he published on mathematics. When he bequeathed his library to the college, he particularly singled out the musical material as precious and rare. Aldrich was a promoter of music in college and university life and his much-prized musical collection is still recognised as an exceptionally important historical source.

To recap. We've seen not just the books but the instruments of the Earl of Orrery installed in the library. (It's perhaps worth noting that, as a student, Orrery was a favourite of Aldrich, who referred to him as the 'great ornament of our college'.) We've seen Adams' new globes and inferred the commissioning of their unique cases as appropriate furniture for the new library. And we've seen the plaster decoration of the walls almost literally incorporate a plethora of mathematical instruments. The link back to the polymathic interests of Aldrich shows how, at Christ Church, instruments could help define not only the intellectual and didactic character of a library, but could even embody institutional identity and memory in architecture itself.



Notes and sources (added 2015)

Images of the architectural interior, decoration and globes in Christ Church Library by Stephen Johnston and Richard Rowley; images of MHS Oxford objects are from [www.mhs.ox.ac.uk](http://www.mhs.ox.ac.uk).

Slide 1 (and 7): Christ Church Library image, public domain,  
<https://commons.wikimedia.org/wiki/File:Chchlib.jpg>

Slide 2: image by Toby Ord under a Creative Commons Attribution-Share Alike 2.5 Generic license,  
[https://commons.wikimedia.org/wiki/File:Tom\\_Quad,\\_Christ\\_Church\\_2004-01-21.jpg](https://commons.wikimedia.org/wiki/File:Tom_Quad,_Christ_Church_2004-01-21.jpg)

Slide 4: for Aldrich, Peckwater Quad and the eventual design, construction and decoration of the Christ Church Library, see Geoffrey Tyack, *Oxford: an Architectural Guide* (Oxford, 1998), pp. 142-3 and 179-181. The image is by Fritz Saalfeld under a Creative Commons Attribution-Share Alike 2.5 Generic license, <https://commons.wikimedia.org/wiki/File:Peckwater-Quadrangle.jpg>

Slide 5: the engraving of Aldrich's projected completion of Peckwater Quad is taken from the Soane Museum's exhibition catalogue *A Passion for Building: The Amateur Architect in England 1650–1850* (London, 2007), p. 29, where Aldrich is discussed and the engraving reproduced.

Slide 6: the quote from Dr Stratford to Edward Harley comes from Jean Cook and John Mason (eds), *The Building Accounts of Christ Church Library, 1716-1779: a transcription with an introduction and indices of donors and craftsmen* (Oxford, 1988), p. 3. Cook and Mason's judgement on the ambition of the Christ Church Library building appears in the Preface.

Slide 8 onwards: for details of Orrery's library and its history in Christ Church, see Owen Massey, 'The Orrery books in Christ Church Library', Early Printed Books Project, Oxford University Library Services (Oxford, 2007); available at [http://www.chch.ox.ac.uk/sites/default/files/Orrery%20Books%20in%20Christ%20Church%20Library\\_0.pdf](http://www.chch.ox.ac.uk/sites/default/files/Orrery%20Books%20in%20Christ%20Church%20Library_0.pdf)

Slide 24: Paul Lawrence Rose, 'Jacomio Contarini (1536-1595), a Venetian patron and collector of mathematical instruments and books', *Physis*, 18 (1976), 117-130, p. 120 for Alberti and the equipping of Renaissance libraries.

Slide 26: the interior view comes from Rudolph Ackermann's *History of Oxford* (1813); public domain, [https://commons.wikimedia.org/wiki/File:Oxford\\_Library\\_of\\_Christ\\_Church.jpg](https://commons.wikimedia.org/wiki/File:Oxford_Library_of_Christ_Church.jpg)

Slide 31: for the techniques of decorative plasterwork, see David McClean, 'Conservation of decorative plasterwork: an Irish viewpoint'; available at [http://www.ihbc.org.uk/context\\_archive/64/irish/plasterwork.html](http://www.ihbc.org.uk/context_archive/64/irish/plasterwork.html)

Slide 36: the two musical instrument trophies are analysed in Eric Halfpenny, 'The Christ Church Trophies', *The Galpin Society Journal*, 28 (1975), 81-85.

Slide 37: for Hearne on Aldrich, see E. F. A. Suttle, 'Henry Aldrich, Dean of Christ Church', *Oxoniensia*, 5 (1940), 115-139, at note 14.

## Additional notes

Instrument historians might be interested to know that the accounts for Christ Church Library show that the Dollond firm was paid £2 for the repair of a telescope in 1771; Cook and Mason (*op. cit.*), pp. 65, 109. In 1773 a Mr Hawting was paid £4 4s 'for work done to the Orrery' (*ibid.*, pp. 69, 111).

For a comparative case of instrumental plasterwork, note that, at the Manchester iCHSTM meeting in 2013, Huib Zuidervaat spoke on the instruments from Johan Maurits Mohr's Batavia Observatory (founded 1765). They had been commissioned from de Paauw in Amsterdam, who acted as agent for the supply of a number of superior London instruments from eg Bird and Dollond. The instruments were sent back to the Netherlands for repair after Mohr's death in 1775 after which they were incorporated into the Felix Meritis foundation. This institution included an observatory which, though initially small, was expanded into a permanent facility. The instruments themselves do not survive and are now only witnessed by plasterwork in the building (itself now repurposed as a European research centre). The plasterwork is specific rather than generic enabling the represented devices to be identified in the inventories of apparatus.