

My starting position is that "**Fit for Purpose**" is the most important feature of any building, i.e. does it perform as requested, is it usable, and is the structure long lasting and economically sustainable.

Then "**Style**" is all about how it looks and how it is composed, i.e. order (plan), geometry (shape), proportions (dimensions), scale (does it fit with the use and landscape), hierarchy (do the different elements fit together), rhythm (repetition and spacing), symmetry (axis and balance), coherence of whole, materials, light & shadows, details such as joints, edges, mouldings, frames, and then the final refinements¹ (enough, not too much), etc.

Then comes "**Symbolism**", or what is the building telling me now (perhaps "communicate" is a better word). But not forgetting what the patron and the architect wanted to say, perhaps many, many years ago.

I want to compare the Radcliffe Camera², the icon of Oxford, with St Catherine's College³, a hidden gem, and both Grade 1 listed buildings.

The Radcliffe Camera, even after ~280 years, which is an exceptionally long service life, is still praised for its quiet atmosphere, the quality of the reading room, and the feeling of studying in one of Oxford's most iconic buildings. The main criticism relates to limited seating during busy periods.

St Catz is valued for the bright rooms, the landscape setting, the spacious layout and the quiet atmosphere. The college is often regarded as one of the most pleasant modern colleges in Oxford for day-to-day living. However the architecture has been criticised as being too uniform, institutional, and lacking the historical character associated with Oxford's older colleges.

¹ My preferred term would be the German architectural word *Durchbildung*. It has no precise English equivalent and conveys much more than "detailing". It describes the complete and consistent development of a design, in which every element—from the overall concept to the smallest joint, edge or moulding—is fully resolved and contributes to the architectural whole.

² Strictly speaking the Radcliffe Camera is the building that housed the Radcliffe Library, which is now part of the Bodleian Library.

³ One of the newest constituent colleges in Oxford, yet, with more than 800 students, also one of the largest colleges in Oxbridge.

Both institutions are "fit for purpose", but are they two completely different styles?



In terms of **the plan**, we have one geometrically complete building organised around a centre, versus a system of interconnected buildings organised on a grid. An architect might describe them as "centralised" versus "linear". But in fact radial and orthogonal organisation are not opposites, they are simply different symmetry groups or different manifestations of geometric order. The Radcliffe Camera is generated by repeated rotation of a single architectural bay about a central point, whereas St Catherine's College is generated by repeated translation of a single structural module along orthogonal axes.

Next, we should think less about what are the proportions, and more about what defines **the proportional system** for each building. For Radcliffe it is the classical canons, which means column height, entablature height, window size, etc., all related back to multiples of the column diameter. For St Catz we know that the architect commissioned a custom size of brick, and then determined mullion spacing, floor heights, beam spacing, window widths accordingly. So both architects worked from one repeating unit.

Scale is the relationship between the dimensions of a building and the dimensions of the objects, spaces and people around it. You can think of height, width, mass, etc., with respect to both people and its immediate surroundings. But perhaps the better way to look at scale is by **contextual integration**, i.e. how well the building relates to its site, neighbouring buildings, landscape, history and views. The Radcliffe Camera is impressive but also highly contextual because it completes Radcliffe Square and terminates iconic views. St Catherine's is moderate in scale, but equally highly contextual because it follows the river setting, preserves open green space and creates a sequence of landscaped courts.

I see **hierarchy** as simply asking if a building has a clear order of importance among its components. This is not about fitting elements together in a jigsaw puzzle, but whether the eye is guided through a story. But here we touch on a more complex issue.

The Radcliffe Camera was conceived as a single object, whereas St Catherine's is conceived as an ensemble. That difference explains why hierarchy operates so differently. The architectural climax of the Radcliffe Camera is the building itself, whereas the architectural climax of St Catz is the sequence of spaces between the buildings.



With the Radcliffe the architect knew we would view it relatively close up, and thus be drawn from the rusticated base, up the Corinthian middle stage, then rapidly past the entablature and balustrade, to the upper dome.

It is possible that Jacobsen, the architect of St Catz, created a horizontal hierarchy, with the sequence of the pool, walkway, dining room.

But I really think that Jacobsen wanted the college to feel egalitarian, so the residential blocks are intentionally similar in height and treatment. To him space was important but not hierarchy. His emphasis shifted from architectural dominance to architectural experience.

With **rhythm** we are back on solid ground, it's just how repeated architectural elements create a predictable visual sequence. In the Radcliffe it's the repetition of paired Corinthian columns, the window openings, the balustrade openings, etc.

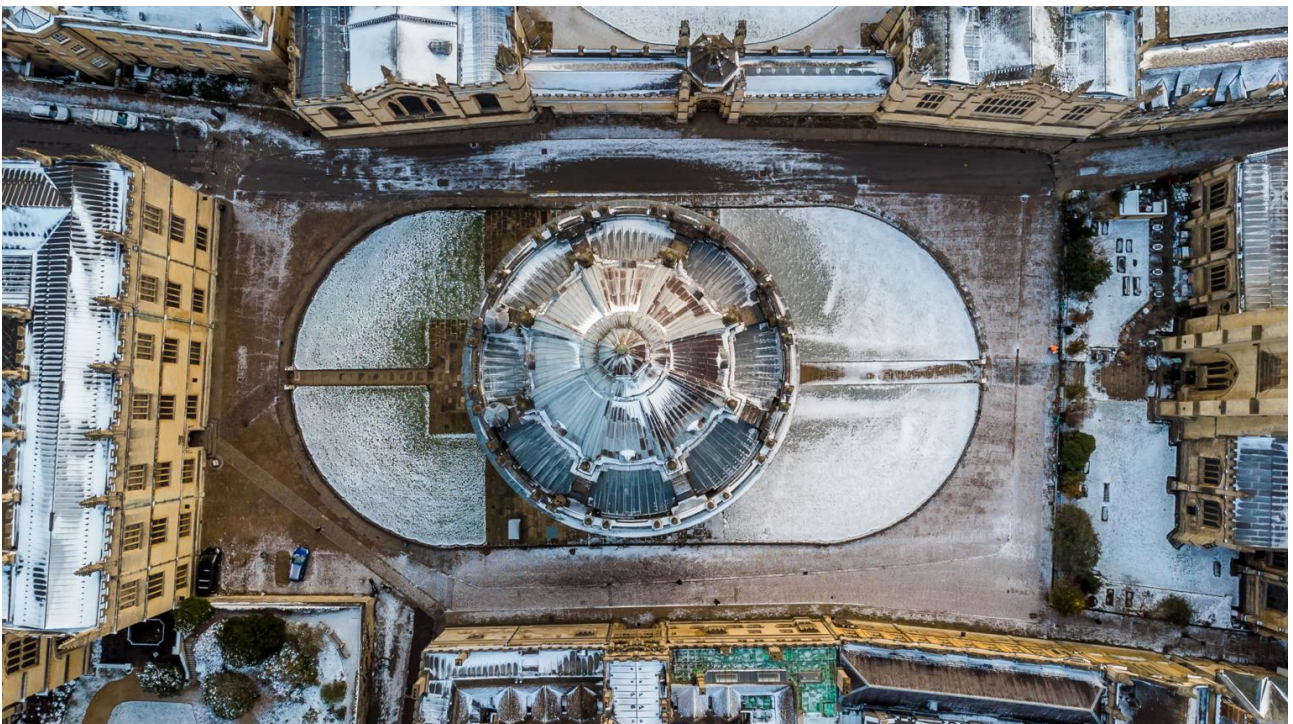


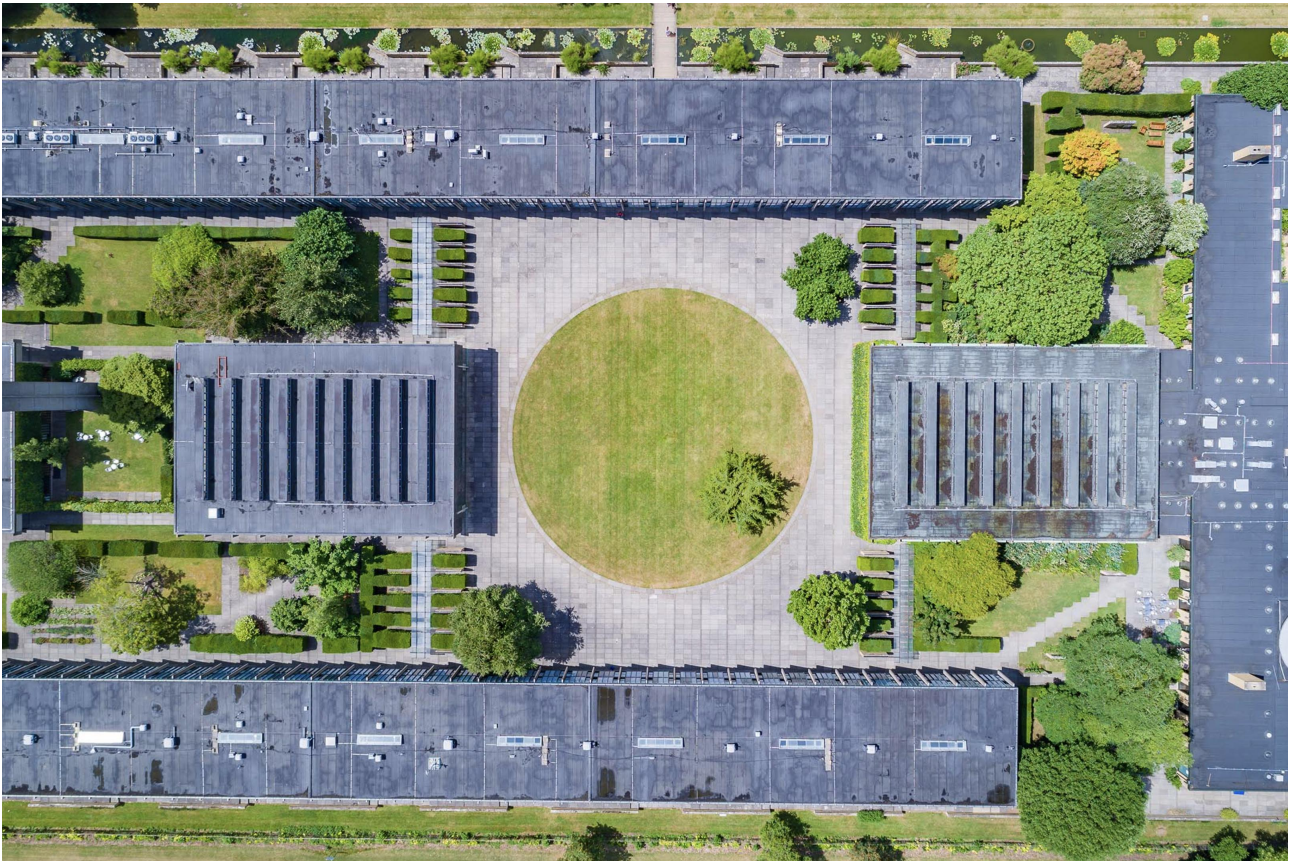
With St Catz the repeated elements are quite similar, namely structural frames, brick panels, window modules, mullions and the roof beams.



I love **symmetry**, it's the invariance of a building or part of a building under a geometric transformation such as reflection or rotation.

The Radcliffe Camera has two kinds of symmetry, reflectional symmetry (every centred elevation is symmetrical about its vertical axis) and rotational symmetry is simply that the complete building is organised around a central point.





St. Catz relies almost entirely on reflectional symmetry.

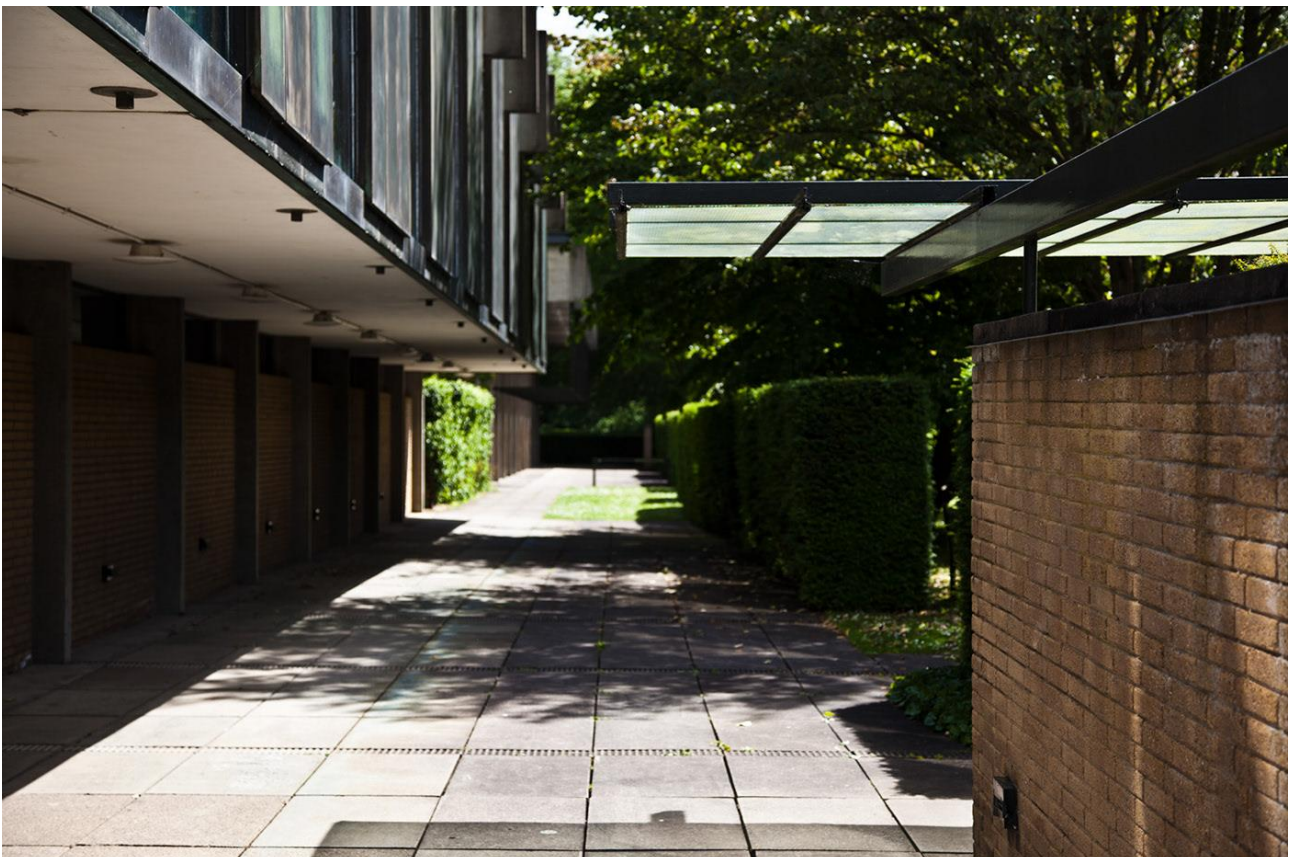
Coherence of the whole is about unity, or the extent to which all parts of a building contribute to a single coherent architectural composition. For the Radcliffe it's one type of stone, one order (Corinthian), one dome, one geometry and one set of proportions. For St Catz it's one brick type, one glazing system, one module, and one family of furniture, lamps, railings, etc., (and down to the door handles).

Materiality is about how materials are selected and finished to support the architectural character of a building. In the Radcliffe we have a limestone rusticated base, ashlar upper walls, and the lead covered dome. In St Catz it's the reinforced concrete frame, specially manufactured brick, the aluminium, glass, and slate.

But it's not simply a matter of aesthetics. We must factor in durability, maintenance, weathering, long-term structural behaviour, thermal performance, acoustics, and how all these materials affect the character of the building.



Light and shadow are the visual effects produced by natural light falling on a building's materials and surface relief.



The Radcliffe Camera is constantly sculpting light, in many ways it was designed to do this. The deep window recesses, the projecting Corinthian columns, the mouldings, cornices, rustication, balustrades, and of course the curved dome, all strengthen the buildings three-dimensional appearance. And I love the warm coloured stone when it catches the sunlight, and the way the shadows are intense.

St Catz uses light in an entirely different way. It creates clear-cut shadows with the projecting beams, recessed glazing, brick texture, and roof overhangs.

But both use daylight. One with the tall windows entering light into the reading areas, and the other with large glazed windows, wide courtyards and reflecting pools of water.

Detailing is about joints, edges, mouldings, frames, etc. The Radcliffe is all about fine joints, crisp cut stone, precision carving. St Catz is about exceptionally regular brick coursing, thin mortar joints, precision aluminium window frames, and not forgetting the bespoke furniture and fittings designed as part of the architecture.

Radcliffe is hand craftsmanship, St Catz is precision engineering.

The last category is about necessary **refinements**, the deliberate addition of decorative architectural elements that are not structural, but still necessary. On the Radcliffe they are the Corinthian capitals, mouldings, cornices, balustrades, etc., all part of the architectural order. Classical ornamentation is missing in St Catz. However Modernists often consider brick textures, and even shadows, as more than just decorative. And we should not forget that the architect designed door handles, furniture, railings, and even selected the fish for the ponds.

"**Symbolism**" comes in many forms, but here we will focus on what the patron and the architect wanted to **communicate**, and how that has evolved.

John Radcliffe wanted to give Oxford a permanent institution dedicated to learning, particularly in medicine and the sciences, although many locals called it "Radcliffe's Mausoleum". The Radcliffe Trustees and James Gibbs, the architect, expressed these aspirations through the language of classical architecture. The dome, Corinthian order, carefully proportioned elevations and fine stonework communicated **permanence** and **intellectual authority**, according to the traditions of ancient Greece and Rome.

The message was clear - Scholarship is a public good, worthy of monumental architecture.

Today almost no one knows who John Radcliffe was, and they don't care. Do they care about the traditions of ancient Greece and Rome? Probably not, and it doesn't really matter. The building is still a library, but it has also become one of the most recognisable images of Oxford and is widely perceived as representing the University itself. It's unique position shouts tradition, prestige and the historic identity of Oxford. To most people it's a cultural landmark, a tourist attraction, and a backdrop to a selfie.

As John Ruskin later wrote, "*When we build, let us think that we build for ever*". The Radcliffe Camera exemplifies this ideal.

The communication of St Catherine's College was equally deliberate but totally different. The University wanted a modern college capable of accommodating an expanding student population, while Arne Jacobsen, the architect, wanted to demonstrate the ideals of post-war Modernism. For him rational planning, precision, structural honesty and the use of contemporary materials and construction techniques were important, and, at the same time, he wanted to ensure that no single element dominated. In some ways he succeeded, among architects and architectural historians, St Catherine's College is widely regarded as one of the

finest examples of post-war Modernism in Britain and as one of Arne Jacobsen's greatest works. But public opinion has often been less enthusiastic. Some see the college as austere, institutional and lacking a visual richness, whilst others admire its quiet, almost monastic vibe. Unlike the Radcliffe Camera, it has not, and never will, transcended its original role to become an internationally recognised symbol of Oxford itself.

As Jacobsen himself wrote *"I have attempted to build on the traditions I encountered at Oxford but sought to translate them into a modern expression. I don't see how one could do anything else... Otherwise, one might end up with... a pastiche, a sad copy of something old"*.

The reader should try to answer two questions. Firstly, which place would you rather see on a day-trip to Oxford? Secondly, where would you prefer your son or daughter to sit, read, and learn?

Annex - A Tale of Two Buildings

In 1712 John Radcliffe had already made it known that he intended to build a library in Oxford⁴, and his will of 8 December 1714 provided £40,000 for the building⁵, £150 per annum for the librarian, and £100 per annum for buying books⁶.

The design⁷ was from James Gibbs (1682-1754)⁸, although the Rotunda⁹ was the idea of Nicholas Hawksmoor (1661-1736)¹⁰. Gibbs was ordered '*to prepare Stones & Things ready for Building the Library*'¹¹. The competition had been between architects who all worked within the language of English Palladian classicism, so it was only about which interpretation. Between 1702-1706 Gibbs had studied architecture in Rome, returning as an expert in Italian Baroque, and by 1735 he was a recognised "Georgian" architect¹².

Radcliffe did not specify the design of the building, and despite Gibbs being the architect¹³, documentary evidence indicates that

⁴ The poet and physician Sir Samuel Garth quipped that Radcliffe founding a library was "*about as logical as if a eunuch should found a seraglio*", given that Radcliffe's reputation relied more on clinical judgement than extensive book learning. *Seraglio* is a harem.

⁵ For architecture, historians usually prefer relative economic significance (share of national income, labour, or GDP). On that basis, John Radcliffe's £40,000 represented an enormous investment, probably tens of millions of pounds today.

⁶ <https://astonrowant.wordpress.com/radcliffe-camera/> The will also explicitly stated that the houses between St Maries & the Scholes in Cattle Street should be purchased. Negotiations about the land were complicated and even needed an Act of Parliament, but finally the first stone was laid in 1737, more than 20 year later. It's worth mentioning that this site was arguably the most prestigious undeveloped site in Oxford, directly between the University's church and its principal academic buildings. That choice alone shows Radcliffe intended the library to occupy a central place in the University.

⁷ https://archive.org/details/b30448979_0001/page/n5/mode/2up

⁸ <https://doriccolumns.wordpress.com/city-streets/architects/james-gibbs/>

⁹ The building, completed in 1748, is the earliest example in England of a circular library.

¹⁰ it appears to have only been Hawksmoor's death in 1736, that led the Trustees to appoint Gibbs.

¹¹ Along with the mason's Francis Smith of Warwick and William Townesend of Oxford.

¹² Having already designed the current Church of St Martin-in-the-Fields in 1726.

¹³ And responsible for the final plan, the elevations, the dome, the internal layout, the architectural details, the choice and specification of materials, and supervised the construction.

the Trustees insisted on Hawksmoor's circular library and dome¹⁴. It's equally true that Hawksmoor's concept was to make the library a great monument rather than merely a practical library¹⁵.

But it was Gibbs who abandoned Hawksmoor's heavy rectangular base, produced a much lighter, more elegant composition, redesigned every elevation, determined the classical orders, designed all the windows, all the mouldings, all the cornices, all the profiles, the drum, the dome¹⁶, the lantern, and the interior. What we see is Gibbs building¹⁷, but once finished¹⁸ what was the reaction of the users¹⁹ and the general public?

Radcliffe had studied medicine at Oxford, and it's certainly highly probable that he wanted to "simply" express his gratitude to

¹⁴ His surviving model shows a rotunda standing on a broad rectangular podium, inspired by the Roman Tomb of Cecilia Metella.

¹⁵ Remember the Trustees had commissioned a model of Hawksmoor's design.

¹⁶ The original intention was to construct a stone dome.

¹⁷ *It is of 3-main stages and of 2-storeys Internally. It is Ashlar-faced and is finished with a lead-covered Dome & Cupola. The Ground-Stage is Rusticated & has a Series of 8-Pedimented Projections, the Cornices of which are carried round the Building. The Main Stage is divided into Bays by coupled Corinthian Columns supporting the Main Entablature; the Bays have a Lower Range of Square windows or Recesses & an Upper Range of Square-headed windows with Pediments alternating with Round-headed Niches. The Main Entablature is surmounted by a Balustraded Parapet with Vases. The Ashlar-faced Drum of the Dome has Segmental-headed Windows & Projecting Pilasters & is finished with a continuous Cornice, Parapet & Vases. The Dome has 8-Panelled Ribs & Lunette-lights; the Octagonal Cupola has a round-headed opening in each Face. The interior of the Building has on both Floors a Series of 8-Piers & Arches forming a Circular Central Area with an Ambulatory, except on the North Side which is occupied by the Staircase. This is of Oval form with a Wrought-Iron Balustrade. The Upper Piers have Ionic Pilasters & half-round Arches with Cartouches in the Spandrels & a continuous Entablature. The Drum has Panelled Pilasters & Swags & the Dome itself is Panelled.*

¹⁸ The New Library was from the first known as the Physic Library, 'being to consist of all Sorts of Books belonging to the Science of Physic, also Anatomy, Botany, Surgery & Philosophy', but the Accessions it received during the first 60-yrs of its existence bore little relation to this description and it was not until 1811 that its Intake was confined to works of a Scientific Nature. Accessions to the Library did not, however, consist entirely of Books. During the 1st-half of the 19th century, it became the home for Coins, Marbles, Candelabra, Busts, Plaster Casts & Statues, but in recent years most of these have been placed in other Repositories more suited to their proper care and display.

¹⁹ Remembering that only a relatively small community of scholars and fellows had access, and undergraduate access came much later. It was a book store and reading room, with open fireplaces and stoves, candles and oil lamps after dark (later gas then electricity), no piped water originally, and privies outside.

Oxford, and his commitment to medical education, civic philanthropy, and his desire to leave a lasting legacy. I think he would have liked his building.

However, the contemporary reaction was not unanimously enthusiastic, but it was overwhelmingly favourable. The University clearly regarded the building as a major achievement. Public reaction to the building itself was extremely positive, but many considered it "Radcliffe's Mausoleum", a way to perpetuate his memory. More unusual, given the deliberately misaligns columns, buttresses and bays, few commented on the architecture. Some were very positive²⁰, others negative²¹, and others more analytical (fence-sitting)²². More focussed criticism came later and was directed not at the architecture, but at its urban planning. However, we suppose the Trustees were happy, they got their dome, and paid the bills.

It's interesting that "user" comments have remained more or less the same over more than 280 years. They praise the quiet atmosphere, the quality of the reading room, and the feeling that they are studying in one of Oxford's most iconic buildings. The main criticisms relate to limited seating during busy periods, and the controlled access.

We have to recognise that the Radcliffe is still serving its original purpose after ~280 years. This exceptionally long service life makes its annualised environmental impact very low. Originally daylight, natural ventilation and fireplaces, have been replaced by relatively compact alternatives. Continuous stone conservation, requires that individual stones must be repaired or replaced. The Radcliffe is admired for its form, dome and setting, and has been accorded a Grade I listed status.

²⁰ The Gentlemen and Lady's Pocket Companion for Oxford (1747) described it as the most magnificent structure in Oxford.

²¹ Horace Walpole thought Gibbs' architecture was heavy and over-massive.

²² John Summerson wrote "*Very rarely in English architecture has the spirit of Mannerism been so pronounced*".

There is no evidence that either the Trustees or the University anticipated that it would become the enduring symbol of Oxford University. That tourist status emerged gradually over the following two centuries through its unique form, central location and continual reproduction in prints, guidebooks, photographs and university publications.

Why has the Radcliffe Camera become Oxford's symbol? Firstly, it occupies one of the most important sites in Oxford, terminating and anchoring multiple streets. It stands in an open space, allowing the dome to be seen from all directions. Its simple circular form is instantly recognisable, even in silhouette. Secondly, it has served the same purpose for nearly 280 years, becoming embedded in the University's identity. Thirdly, millions of photographs, paintings and films have reinforced its status.

Just as the Radcliffe "sticks out", **St Catherine's College** is in hiding. Dating from 1962²³ it is one of the newest constituent colleges in Oxford²⁴, yet, with more than 800 students, it's one of the largest colleges in Oxbridge. The college buildings date from the 1960s and were designed by Danish architect Arne Jacobsen, along what is called an egalitarian architectural style²⁵. The architect adopted a traditional Oxford quadrangle²⁶, but then avoided all references to other historical (and classical) architectural forms. Yet, with the Radcliffe, both are Grade 1 buildings.

Students generally value the bright rooms, landscaped setting, spacious layout and quiet atmosphere. The college is often regarded as one of the most pleasant modern colleges in Oxford

²³ It can trace its origins back to 1868, as a delegacy for *Scholares nulli Collegio vel Aulae ascripti*.

²⁴ Unlike the Radcliffe Camera, which was funded almost entirely by the bequest of one individual, the land was offered by Merton College, and the construction was funded by the University, private donations and gifts.

²⁵ Maximises the number of rooms for academically qualified students who lack the financial resources to study at Oxford

²⁶ Jacobsen designed everything, including the furniture, cutlery, lampshades, and the college gardens, down to the choice of fish species for the pond.

for day-to-day living. However the architecture has been criticised as being too uniform, institutional or lacking the historical character associated with Oxford's older colleges²⁷.

Comparing like with like...

It's difficult because the Radcliffe is just a library building, whereas St Catz is an entire college²⁸.

The Radcliffe is pure classical architecture as expressed through symmetry, proportion, hierarchy and historical precedent. A geometrically perfect central form (a cylinder surmounted by a dome), and festooned with all the classical ornaments, e.g. columns, entablatures, orders, cornices and exquisitely controlled proportions. It had, and still has, civic dignity, elitist grandeur, and a touch of the absurd with all those rectangular books, on rectangular shelves, in a cylindrical building with no straight walls and no corners. But it works, and works well.

The Radcliffe's initial cost was £40,000, the equivalent today of several tens of millions, whereas St Catz only cost approximately £2.5 million to build, excluding the gift of land. Remember, Jacobsen designed was modular, used modern materials, and was void of all those historical frilly bits.

A modern reconstruction of the Radcliffe Camera in Bath or Headington stone, with hand-carved masonry, a dome, and using traditional craftsmanship (but with modern building services) would probably cost on the order of £80–150 million. To rebuild St Catz, with current building regulations and services, the cost could well exceed £250–400 million.

²⁷ By contrast, architects frequently regard St Catherine's as one of the finest examples of post-war Modernism in Britain.

²⁸ Accommodation for more than 800 students, dining hall and kitchens, library, lecture rooms, common rooms, sports facilities, landscaped grounds, and even a porter's lodge and flushing toilets.

Both are Grade 1 listed, the Radcliffe operating cost are probably ~£1–3 million/year²⁹. St Catz is now more than 60 years old, but reinforced concrete has a finite service life and significant repairs are needed. The central heating, lighting and extensive services have substantially higher operational energy demands, and significant refurbishment needs, including replacement of reinforced concrete roof elements affected by RAAC. Its annual income of around £20 million is used almost entirely to fund its annual operating costs, including teaching support, accommodation, catering, maintenance and administration, rather than to generate a commercial profit.

Maintenance of the Radcliffe is time consuming. The columns and pilasters might express the classical orders and provide visual rhythm and scale, but they project beyond the wall where they collect dirt, biological growth and pigeon droppings, and require periodic stone conservation. The entablature and cornice provide a clear horizontal termination and visual proportions, but horizontal ledges trap water and debris, encouraging weathering and bird roosting. The dome creates a monumental central reading room and admits daylight through high windows, but is complex and expensive to construct and maintain, and much of the interior depends on light from above, giving less uniform illumination than modern curtain-wall glazing. Stone masonry is durable, repairable and capable of lasting centuries, but is labour-intensive and expensive to maintain. The symmetry of the rotunda and dome is elegant, but difficult to alter or extend. The classical ornamentation communicates hierarchy and enriches the façade, but has long-term maintenance requirements.

The simple geometric forms of St Catz are functional, but can be seen as austere. The flat roof maximises usable space, but can leak and needs more maintenance than a pitched roof. Brick, concrete and steel are easy to standardise, but reinforced concrete can deteriorate over time, and is expensive to repair. Abundant glazing lets in light, but increases heat loss in winter and solar glare in summer. No ornamentation reduces cost and maintenance, but projects an impersonal feeling. Modular planning is efficient, but can limit major changes to the use of the available interior space.

²⁹ The Radcliffe Camera does not have separate published accounts.

However, the emphasis on light, openness and functionality remains.

St Catherine's College gains its character from restraint, modularity and functional planning, reducing decorative maintenance, but introduces long-term issues associated with 20th-century construction materials.

To make a credible comparison of the two buildings we need to first look at how they meet the expectations of the users, i.e. **fit for purpose**. Next we must look at the **style** of buildings, and not just appearance. Finally we must understand what the buildings are trying to tell us (**communication**).