

Frank Lloyd Wright and Japanese Architecture: A Study in Inspiration

From the opening of the century through to the present day, the relationship between the work of Frank Lloyd Wright and the traditional architecture of Japan has been a recurring source of discussion, and no little puzzlement. One of the principal factors in maintaining this interest has been the fact that whilst Wright freely acknowledged an important philosophical debt to Japanese art, and to the wood-block print in particular, he consistently rejected suggestions that Japanese architecture had any direct impact on his work. Indeed, throughout his career Wright maintained that he found in Japanese culture not the inspiration which many suspected, but merely *confirmation* of many of his own 'organic' design principles.¹

The first of Wright's repeated efforts to differentiate his appreciation of Japanese aesthetic ideals from any use of Japanese *forms* came in response to the English Arts and Crafts architect C. R. Ashbee, whom Wright invited to introduce the 1911 Wasmuth photo-study of his work.² Despite being a personal friend, Ashbee felt obliged to raise what he obviously knew to be a sensitive issue with Wright, observing in his essay that

the Japanese influence is very clear. He [Wright] is obviously trying to adapt Japanese forms to the United States, even though the artist denies it and the influence must be unconscious. It is particularly evident in the way he brings out the picturesque element of his buildings.³

The reaction which this drew from Wright was to set the tone for his general response to suggestions of any direct formal debt to Japanese architecture, an issue which, nevertheless, was to come up time and again throughout the remainder of his long career. After seeing the early proofs of Ashbee's foreword, Wright wrote to him protesting:

My conscience troubles me—Do not say that I deny my love for Japanese art has influenced me—I admit that it has but claim to have digested it—Do not accuse me of trying

to 'adapt Japanese forms' however, THAT IS A FALSE ACCUSATION AND AGAINST MY VERY RELIGION. Say it more TRUTHFULLY even if it does mean saying it a little more gently.⁴

Despite Wright's frequent statements to this effect, in the years since his death in 1959 critics have persistently felt obliged to draw attention—if only in passing—to various formal similarities between his work and traditional Japanese buildings, thereby establishing a vague but none the less widespread perception that he derived more from Japan than simply collateral support for his 'organic' principles. Yet, whilst the belief that Japanese architecture did in fact play a part in Wright's career is now fairly widely accepted, its precise role remains far from clear. Clarifying the nature of that role is the primary aim of this paper. More specifically, with a view to casting light on Wright's general approach to design, it is intended to show precisely how he made use of several existing Japanese built-forms.

'Japanism', the late nineteenth-century Western vogue for things Japanese, which developed initially from French *Japonisme*,⁵ was closely related to the general heightening of European and American interest in aesthetics and decorative design during the second half of the nineteenth century, usually known as the Aesthetic Movement.⁶ Whilst extraordinarily varied in its artistic manifestations, this movement centred on a conception of beauty as a universal ideal transcending both social and ethnic boundaries. And during the latter part of the nineteenth century, this attitude, combined with a well-established popular taste for the exotic, led to the art and artefacts of non-Western cultures in general, and those of the Far East in particular, coming to be regarded as legitimate sources of inspiration for Western artists and designers.

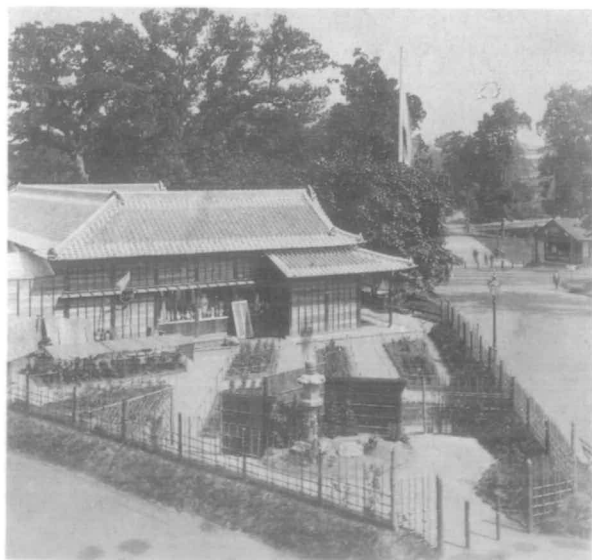
In response to a growing popular European interest in the newly opened Japan, stimulated by the Japanese presence at the London Exhibition of 1862

and at the subsequent Paris and Vienna Expositions of 1867 and 1873, by the mid-1870s a steady flow of Japanese artefacts had begun arriving in the capitals of Europe.⁷ With the exception of Whistler and the other well-known London-based painter associated with *Japonisme*, James Tissot (1836–1902), the artistic side of Anglo-American Japanism did not really come into its own until at least a decade after its French counterpart. As in Europe, early American interest in Japanese art had been mainly restricted to a relatively small group of artists and specialist collectors in the major cities.⁸ However, the Japanese exhibit at the 1876 Philadelphia Centennial Exposition was to change everything. Indeed, according to the well-known zoologist and Japan scholar Edward S. Morse (1838–1925) it came as a revelation to most Americans;⁹ and its Japanese buildings in particular were to have an especially lasting impact, having remained as permanent gifts to the city [1].¹⁰

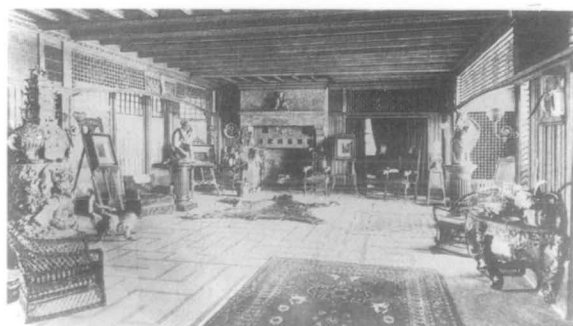
The architectural impact of the Japanese exhibit in Philadelphia was immediate and widespread, appearing in the domestic decor of well-to-do town houses from Baltimore to Boston, and even in the form of complete vacation homes at several of the fashionable eastern resorts.¹¹ A prime example was McKim, Mead & White's Victor Newcomb house at Elberon, New Jersey, in which a grille-like *ramma*,¹² abstract *tatami* mat patterns, and a continuous

timber lintel, or *kamoi*, were integrated into an otherwise essentially Queen Anne interior [2].¹³

The work of the brothers Charles and Henry Greene (1868–1957 and 1870–1954) in California is probably the best-known Japanese-influenced American domestic architecture of the period around the turn of the century [3]. The Greenes themselves made no secret of their admiration for Japanese art and architecture, and in some of their early designs in particular even employed several overtly Japanese motifs, including the *irimoya* roof form.¹⁴ Whilst their productive careers began slightly later and ended at least four decades earlier than Wright's, the Greenes were his exact contemporaries, and their work represents a useful bench-mark against which to judge his interpretation of Japanese architecture. In fact, as I hope to show, Wright's particular approach to Japanese forms would appear to have been quite distinct from that of the Greenes—and indeed from that of most of his American and European contem-



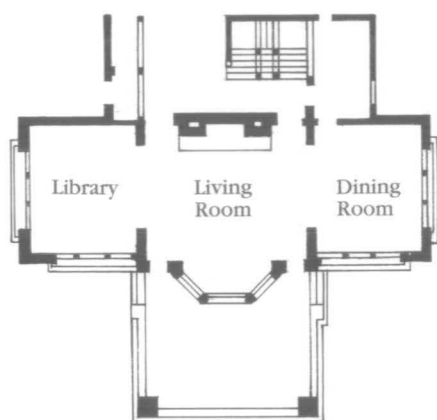
1 The 'Japanese Bazaar'. Philadelphia Centennial Exposition, 1876



2 McKim, Mead & White, living room of the Victor Newcomb house, Elberon, New Jersey, c. 1880 (from Appleton & Co., *Artistic Houses*, 1883–4, vol. 2)



3 Greene and Greene, the Gamble house, Pasadena, California 1908



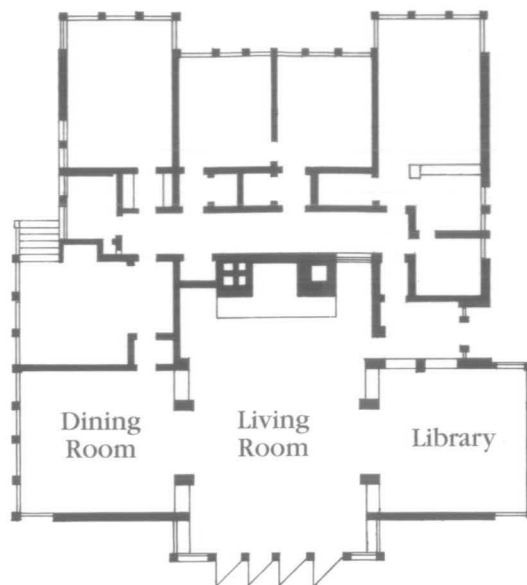
4 Wright, 'A Home in a Prairie Town' project, the *Ladies' Home* *Journal*, February 1901

poraries—in apparently being much more concerned with underlying forms than with surface details.¹⁵

The Central Hall of the Ho-o-den and the Early Prairie House (1893–1909)

In the early Prairie House Wright effectively reduced the American suburban dwelling to a generic form consisting of a large communal space centred on a free-standing chimney and flanked by related dining and study areas [4–5]. Whilst this development in Wright's domestic work was in line with the general process of simplification taking place in the American home at the turn of the century,¹⁶ the particular configuration of the early Prairie House appears to have had part of its inspiration in the central hall of the Ho-o-den, the Japanese pavilion built in south Chicago for the 1893 World's Columbian Exposition, which remained on its prominent island site at the centre of Jackson Park for almost half a century [6–7].¹⁷

The plan of the Ho-o-den's central hall consisted of four main spaces: the *jodannoma*, a private sitting area which was separated by a change of level from the *tsuginoma*, where guests were received; the *shosai*, a study or library; and the *konnoma*, a food-serving room [8–9]. The central hall of the Ho-o-den and the programme for the American family dwelling, then, accommodated broadly similar domestic functions, and each element of the Japanese arrangement appears to have quite logically given rise to its Western equivalent in the early Prairie House plan:



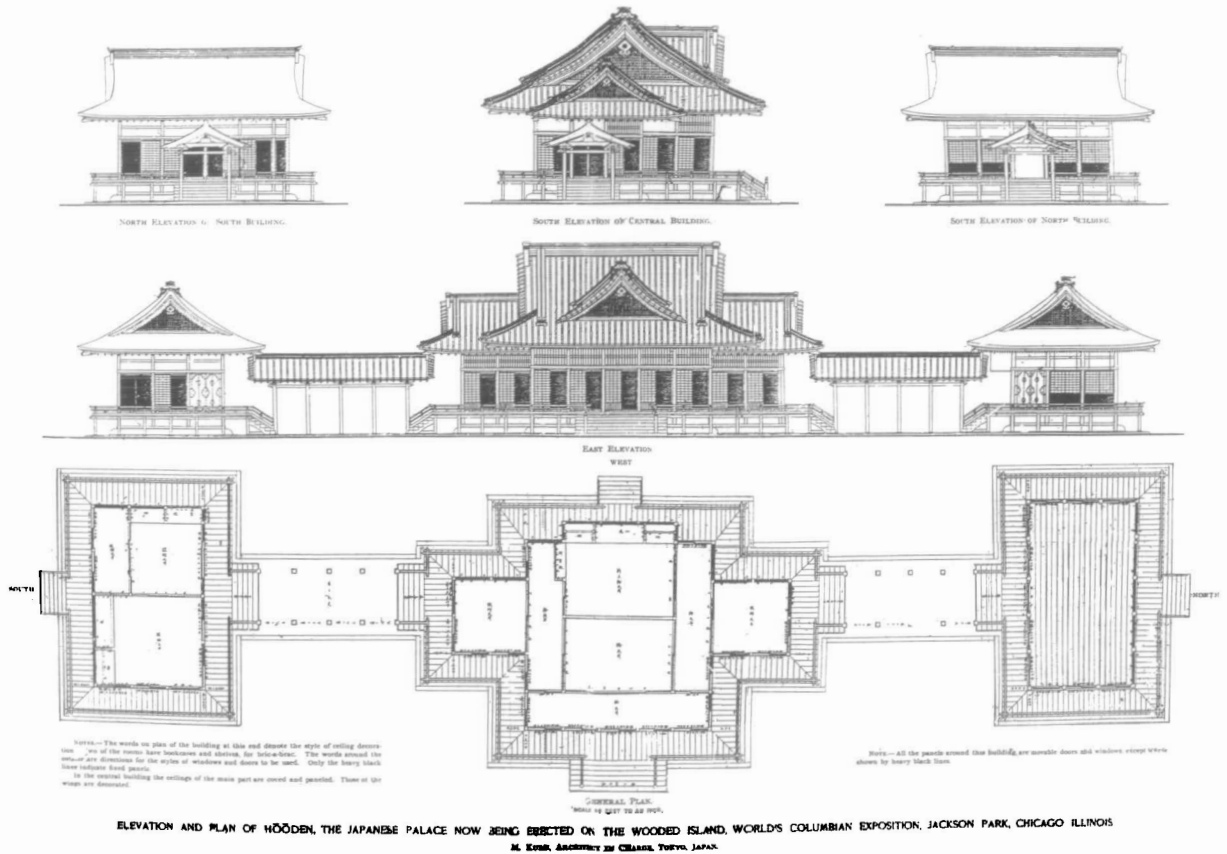
5 Wright, the Edwin Cheney house, Oak Park, Illinois, 1904 (designed in 1893)

the *jodannoma* becoming a sitting area directly in front of the hearth, which had replaced the traditional decorative wall-alcove, the *tokonoma*; the *tsuginoma* becoming a living area; the *konnoma* a dining room; and the *shosai*, a study or library [10].¹⁸

Under normal circumstances the various spaces of the central hall of the Ho-o-den were separated by *fusuma* (opaque sliding screens). However, during the World's Fair several of these screens were removed in order to allow visitors a better view of the interiors from the surrounding verandah, since



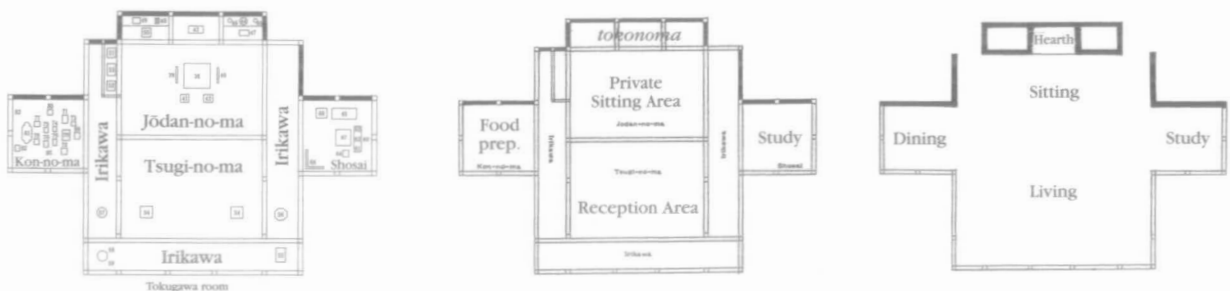
6 The Japanese pavilion, the Ho-o-den, World's Columbian Exposition, Chicago, 1893



7 Scale drawings of the Ho-o-den as they appeared in the *Inland Architect* in December 1892

they were not permitted actually to enter the *tatami*-covered rooms. From this point, it required only a relatively short step, then, to imagine all the internal divisions removed, leaving essentially one large space serving several different functions. And the

implications of this for the American domestic interior were apparently not lost on Wright, who later described this characteristic as one of the central features of the new Prairie House.¹⁹



8 The plan of the central hall of the Ho-o-den as it appeared in the official catalogue in 1893

9 The main functions of the central hall of the Ho-o-den

10 Generic plan configuration of the early Prairie House

Dwellings of that period were 'cut-up', advisedly and completely, with the grim determination that should go with any cutting process. The 'interiors' consisted of boxes beside or inside other boxes, called rooms. All boxes inside a complicated boxing. Each domestic 'function' was properly box to box. I could see little sense in this inhibition, this cellular sequestration that implied ancestors familiar with the cells of penal institutions, except for the privacy of bedrooms on the upper floor. They were perhaps all right as 'sleeping boxes'. So I declared the whole floor as one room, cutting off the kitchen as a laboratory, putting servants' sleeping and living quarters next to it, semi-detached, on the ground floor, screening various portions in the big room, for certain domestic purposes—like dining or reading, or receiving a formal caller. There were no plans like these in existence at the time.²⁰

There were indeed no plans *precisely* like that of the early Prairie House at the time. However, one only had to remove the *fusuma* from the central hall of the Ho-o-den in order to produce something very similar. And ironically, it seems this may have been the origin of some of the practical problems inherent in several of Wright's early houses.

Without internal divisions, for example, there was little separation between such incompatible activities as dining and study. Similarly, although Wright occasionally used fixed seating and other types of screen in an attempt to offset the feeling of exposure in some of the Prairie House living rooms, as in the 1902 Ward Willits house, for example, within an open-plan arrangement the sitting area in front of the typical Prairie House hearth was often far from intimate (see [4–5]). However, despite these drawbacks, it would seem that Wright's adoption of the

plan configuration of the central hall of the Ho-o-den in the early Prairie House, although very probably initiated by an aesthetic admiration of the form itself, was also based on a not unreasonable analogy between essentially similar domestic programmes.

The Nikko Taiyu-in-byo and Unity Temple (1905)

Shortly before the end of his first visit to Japan, in late April 1905, Wright made the popular tourist pilgrimage to the mountain resort of Nikko, a hundred miles north of Tokyo, where hotel records unearthed by Masami Tanigawa indicate that he stayed at the prestigious Kanaya Hotel from 23 to 26 April 1905.²¹ The two main attractions of Nikko are its famous mausoleums, the Toshogu and the Taiyu-in-byo, in which the Tokugawa shoguns Ieyasu (1543–1616) and his grandson Iemitsu (1604–51) were interred as *gongen*, or deified spirits [11]. Like most visitors to Nikko, Wright seems to have been impressed with these structures, although not, however, with their fabulously rich decoration, for which the Toshogu in particular is justly famous, but rather with their distinctive *gongen*-style plan forms.²²

Within a month of visiting Nikko, Wright and his wife Catherine were back in Oak Park, where, three weeks later, their local Unitarian church was struck by lightning and burned to the ground.²³ Through Catherine, who had taught Sunday school at the church, and his own uncle, the Revd Jenkin Lloyd Jones, Wright had good connections with the Unitarian elders, and it was no surprise when he was invited to prepare proposals for a replacement building. The resulting plan, which Wright presented to the church committee in early September 1905, bore a marked resemblance to the *gongen*-style forms



11 The Taiyu-in-byo, Nikko, Tochigi Prefecture, 1653



12 Wright, Unity Temple, Oak Park, Illinois, 1905–6

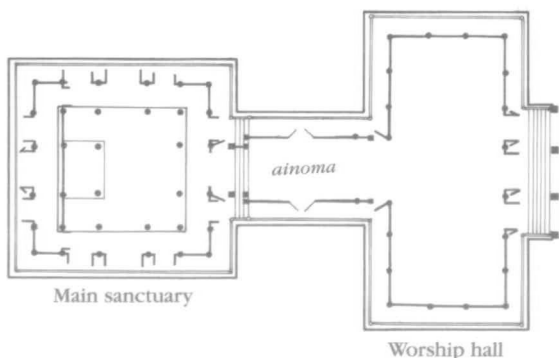
which he had seen at Nikko a few months earlier [12–14],²⁴ and this distinctive dual-function *parti* appears to have provided the basis for several of his subsequent public buildings, including, for example, the Johnson Administration Building [15–16].²⁵

The plan form of Unity Temple, then, which Peter Blake suggested every functionalist ‘found an eminently satisfactory solution to the organisation of a multi-functional building’,²⁶ seems to have had its primary inspiration in the *gongen*-style plan form of the Nikko Taiyu-in-byo. And this might well explain why Wright persuaded his client, Pastor Rodney Johonnot, to look upon his new church as a ‘temple’, the Pastor having suggested in his description of Unity Temple:

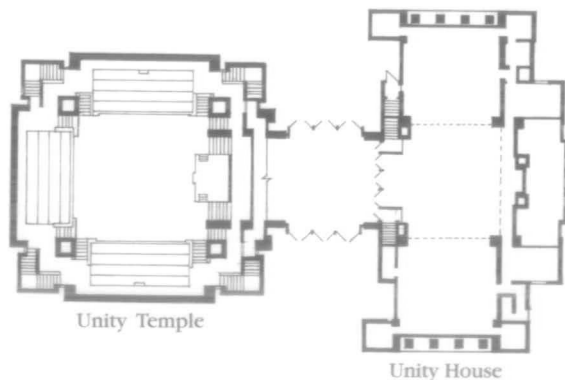
This building which is to be dedicated to the worship of the one true and living God in the spirit of Christian faith may then very properly be called a ‘temple’. The term is further made specially fitting here because the building has the feeling and to some extent the form of an ancient temple.²⁷

Given this explanation, it may be significant, then, that the Nikko Taiyu-in actually functions as a Buddhist *temple*, as opposed to a Shinto shrine, which is the more common use of the *gongen*-style plan form.²⁸

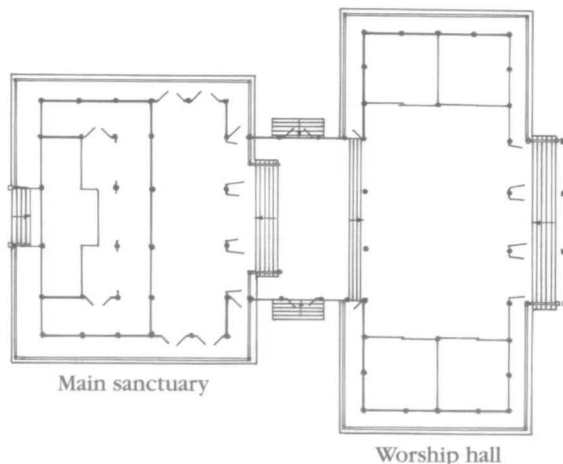
The *gongen*-style *parti* consists of three distinct elements reflecting its principal functions: the *honden*, a sanctuary reserved for the spirit deity; the *haiden*, an oratory for worshippers; and a narrow



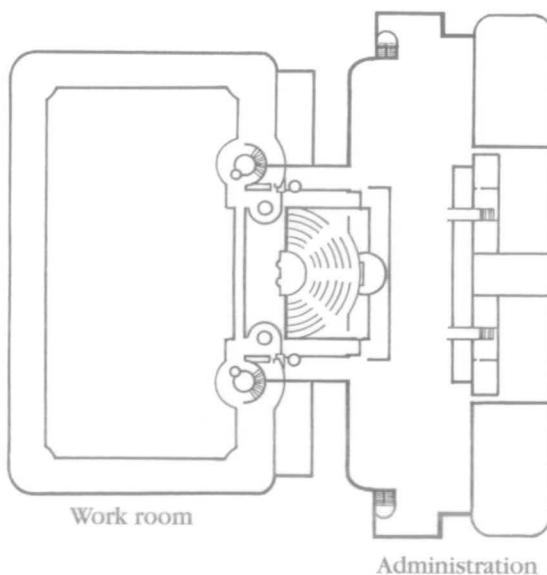
13 The *gongen*-style plan form of the Nikko Taiyu-in-byo



14 Plan of Unity Temple, Oak Park, Illinois, 1905–6



15 The *gongen*-style plan form of the Nikko Toshogu, Tochigi Prefecture, 1634



16 Wright: the Johnson Administration Building, Racine, Wisconsin, 1936

intermediate corridor connecting these two spaces, which was originally simply a paved covered-way for the use of the priests as they moved between the main structures. In a later development this central space was enclosed and given a timber floor, as in the Nikko Tosho-gu, for example, where it retains the name *ishinoma* or 'stone area' (see [15]). In subsequent plans, such as that of the Nikko Taiyu-in, the floor of this intermediate or 'between' space was raised to the same level as that of the worship hall, where it is usually known as the *ainoma* (see [13]).

The *gongen*-style plan form, then, had developed in order to accommodate a programme consisting of two primary functions which needed to be physically linked, and as Pastor Johonnot explained—apparently under Wright's guidance—the programme for Unity Temple encompassed an essentially similar dual role: 'A modern church building has a two-fold purpose; it is erected for the worship of God and for the service of man. These two functions demand a different architectural treatment that each may best be served.'²⁹ There would seem to have been a fairly logical correlation, then, between the *gongen parti* and the programme for Unity Temple. Indeed, in explaining the design to his client, Wright appears to have emphasized the appropriateness—if not the origin—of this dual-purpose plan form, Pastor Johonnot having particularly stressed this point in his description of the new church:

In the design adopted for Unity Church there are two distinct buildings, one designed for public worship and other suitable public meetings, and another for purposes of social service and religious meetings of a less formal character. They are, however, connected by a large Entrance Hall by which they are knitted together into a single integral and harmonious structure in outward appearance, thus giving unity to the two functions of a church, and guarding against the idea that the one purpose of worship is alone holy and the other common and unclean.³⁰

Despite the appropriateness of the formal analogy, however, and the fact that the Unity Temple plan seems to have worked well in practice, Wright was apparently reluctant to acknowledge its origin, preferring instead to explain the design of the new church on the basis of purely practical considerations. Via Pastor Johonnot, for example, he suggested that 'the plan and style of architecture . . . are the natural and even necessary outcome of existing

conditions; the rational solution of a given problem'.³¹

In accordance with this pragmatic explanation, Wright justified his choice of a square plan for the main room of Unity Temple on the basis that it was the simplest and therefore cheapest form to cast in concrete, having explained:

What shape? Well, the answer lay in the material. There was only one material to choose—as the church funds were \$45,000—to 'church' 400 people in 1906. Concrete was cheap . . .

The wooden forms or moulds in which concrete buildings must at that time be cast were always the chief item of expense, so to repeat the use of a single one as often as possible was necessary. Therefore a building, on all four sides alike, looked like the thing. This, reduced to simplest terms, meant a building square in plan. That would make their temple a cube—a noble form in masonry.³²

Undoubtedly the square form did make constructional and therefore economic sense. However, this does not appear to have been the prime motive for its use, but simply a useful bonus deriving from the square plan of the Taiyu-in sanctuary.

Similarly, Wright suggested that the positioning of the main entrance to Unity Temple had been dictated by the practical need to avoid the noise of the adjacent main street, having explained that 'the site was noisy, by the Lake Street car-tracks. Therefore it seemed best to keep the building closed on the three front sides and enter it from a court to the rear at the centre of the lot'.³³ In fact, the inspiration for the shared central entrance to Unity Temple appears to have had its origin in the *ainoma* of the Taiyu-in; and there was simply no other way to position the elongated *gongen* plan form on the available site other than by orientating it along the wider, Kenilworth Avenue frontage. So the *ainoma*, and with it the entrance, would inevitably have ended up some distance away from Lake Street.³⁴

Likewise, in the knowledge of his awareness of the *gongen* plan form from early 1905, the impression given by Wright, that the similarly 'semi-detached' *parti* of Unity Temple sprang entirely from the requirements of the new programme, suggests the kind of *post hoc* rationalization with which most designers can probably identify. Several decades after the event, Wright recalled in his autobiography:

Unity Temple itself with the thoughts in mind I have just expressed, arrived easily enough, but there was a secular

side to the Universalist church activities—entertainment often, Sunday school, feasts, and so on.

To embody these with the temple would spoil the simplicity of the room—the noble Room in the service of man for the worship of God. So I finally put the secular space designated as 'Unity House', a long free space to the rear of the lot, as a separate building to be subdivided by moveable screens for Sunday school or on occasion. It thus became a separate building but harmonious with the Temple—the entrance to both to be the connecting link between them. That was that.³⁵

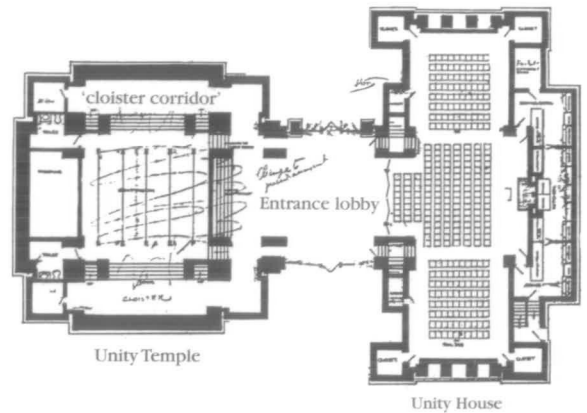
Wright described his decision to raise the floor of the main hall of Unity Temple above that of the entrance lobby as deriving from a similar combination of practical considerations, having explained:

Should the pulpit be put toward the street and let the congregation come in and go out at the rear in the usual disrespectful church fashion so the pastor missed contact with his flock? And the noise of the street cars on Lake Street come in?

No. Why not put the pulpit at the entrance side at the rear of the square Temple entirely cut off from the street and bring the congregation into the room at the sides and on a lower level so those entering would be imperceptible to the audience? . . . Out of that thought came the depressed foyer or 'cloister' corridor either side, leading from the main entrance lobby at the center to the stairs in the near and far corners of the room.³⁶

In fact, the change of level between the entrance lobby and the main hall of Unity Temple appears to have been inspired by the similar one between the *ainoma* and the main sanctuary in the Taiyu-in, something which would seem to be further suggested by the central steps which appeared in one of the earlier versions of the Unity Temple plan [17] (and see also [13]).

Likewise, the change of level between the central area of the main hall of Unity Temple and the sunken 'cloister corridors' surrounding it may well have come from the raised podium in the middle of the Taiyu-in sanctuary (see [13,17]). Indeed, although Wright justified these depressed corridors on the grounds that they reduced the disturbance caused by late arrivals, at 13 ft in width they seem remarkably generous considering they were only to be used for circulation, and the need for them could have been avoided altogether if the position of the pulpit had been conventional, i.e. at the opposite end to the entrance doors, late-comers simply slipping into the



17 An early version of the Unity Temple plan, c. 1905-6

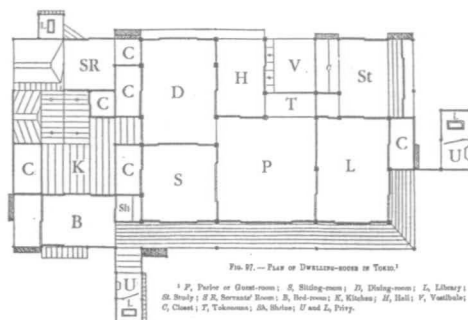
rear pews unnoticed in the time-honoured tradition. So the question arises of whether these sunken 'cloisters', of which Wright was evidently fond, may not have been the motivation for the unconventional location of the pulpit, rather than vice versa.

It would seem, then, that several of the changes of floor-level in the plan of Unity Temple may well have stemmed from elements in the Taiyu-in finding their way into the new building on less than entirely logical grounds, an effect which Geoffrey Broadbent has characterized as 'analogue takeover'.³⁷ Perhaps one of the clearest examples of this at Unity Temple was the carrying over of the end projection formed by the main entrance steps of the Taiyu-in, although again Wright actually turned this to good use in the new plan, as a kitchen serving Unity House.

According to Wright, the square geometric 'grammar' of Unity Temple derived from the practical demands of building its essential idea, the 'cubic room'. Yet, as we have seen, the Taiyu-in, rather than practical necessity, appears to have been the primary inspiration for the square plan of this main room. So the decision to make it a cube would appear to have derived ultimately from the same source, although Wright was also able to justify this square geometry on purely constructional grounds, having suggested:

The grammar of such style as is seen here is simply and logically determined by the concrete mass and flat layer formation of the slab and box construction of the square room, proportioned according to concrete-nature—or the nature of the concrete.³⁸

In explaining the design of Unity Temple Wright suggested that certain simple geometric forms had distinct psychological associations, 'as, say, the cube or square, integrity; the circle or sphere, infinity; the straight line, rectitude; if long drawn out . . . repose; the triangle . . . aspiration, etc'.³⁹ However, his own approach to these forms does not seem to have been particularly consistent. For example, several years earlier, in *The Japanese Print*, Wright had cited the *spire*—as opposed to the triangle—as representing that most essential of religious sentiments, 'aspiration'.⁴⁰ Yet later, in his autobiography, he justified his exclusion of a spire from Unity Temple on the very grounds of its powerful symbolism, having argued:



Why not avoid the symbol, as such? The symbol is too literal. It is become a form of Literature in the Arts.

Then why the steeple of the little white church? Why *point to heaven*? . . .

Was not that 'finger,' the church steeple, pointing on high like the man who climbed on high to see HIM? A misleading symbol perhaps.⁴¹

Although Wright spoke of primary forms as though they were universal symbols, then, in practice he appears to have interpreted their meanings quite pragmatically, which would seem to reinforce the view that the cubic form of Unity Temple probably derived as much from the square plan of the Taiyu-in sanctuary as from any preconceived symbolism, although there is no denying its power as a meditative space.

20 The *Life* house plan as built in the form of the Bernard Schwartz house, Two Rivers, Wisconsin, 1939

The design which Wright produced for *Life* magazine in September 1938 for a prototype middle-income family dwelling appears to have had part of its inspiration in one of the Japanese house plans illustrated in Edward Morse's pioneering work *Japa-*

eventually built the following year in the form of the Bernard Schwartz house [20].

Whilst the precise disposition of functions within the *Life* house is somewhat different from that of the Japanese plan, the basic zones for sitting, sleeping, and cooking remained essentially the same, the original Japanese arrangement having been logically designed to separate wet and dry functions, and to turn the most private rooms to the south-facing rear of the house. Indeed, the open plan of the *Life* house could well have been inspired by the multiple roles which rooms are commonly required to perform in the Japanese home, especially since in describing this particular house Edward Morse had specifically commented on the advantage of being able to make use of the entire floor if necessary.⁴³

However, Wright clearly did not simply remove the *fusuma* and use Morse's Japanese plan as found. On the contrary, he was evidently quite prepared to break with it when necessary, as, for example, in his relocation of the main entrance to a position which made more sense in terms of the privacy of the new open plan. Similarly, the dining area was moved to a fixed location where it was more convenient to the kitchen.

Perhaps one of the most striking instances of Wright turning an existing form to an entirely new purpose was his extension of the verandah of the Japanese plan to become the swimming pool of the *Life* house, which was even given the same 'timber-plank' rendering (see [18,19]). However, the reverse was also occasionally true, elements sometimes remaining for no apparently logical reason. For example, a *benjo*, or 'privy', in the Japanese plan became simply an external planter in the Schwartz house, where its purpose appears to have been as much aesthetic as practical. Indeed, the way in which some features of the Japanese plan were given new functions, other disappeared, and yet others, such as the *benjo*, remained as aesthetic relics, would seem to be an example of a process analogous to biological evolution operating in an architectural form.⁴⁴

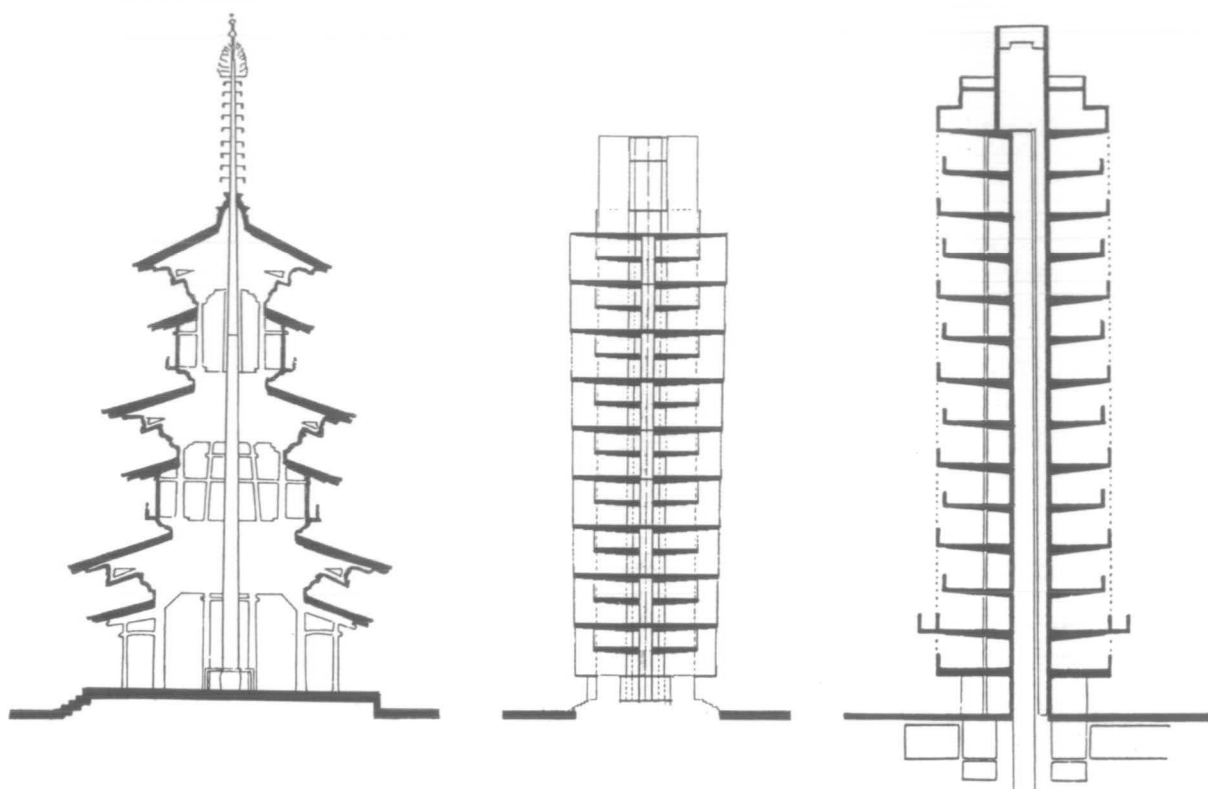
However, despite the fact that Wright's initial interest in this Japanese plan was probably aesthetic, his use of it in the *Life* house again seems to have been underpinned by a reasonable analogy between essentially similar domestic programmes.

Yakushi-ji Pagoda and the Johnson Research Tower (1944)

Whilst in Japan, either in 1905 or subsequently during the building of the Imperial Hotel (1916–22), Wright appears to have visited the historic city of Nara, just south of Kyoto. And as Clay Lancaster first pointed out, the unusual staggered section of the east pagoda of Yakushi-ji temple (718), on the southern outskirts of this ancient capital, seems to have made a particular impression on him,⁴⁵ having apparently provided the inspiration for several of Wright's subsequent cantilevered-tower designs [21–23].⁴⁶ Although the first of these, the 1929 St. Mark's Tower project, never came to fruition, its distinctive cantilevered section was eventually to be realized fifteen years later in the form of the Johnson Research Tower [24]. It was no coincidence, then, that having drawn an analogy between the pagoda form and the pine tree,⁴⁷ Wright later described the



21 The east pagoda of the temple of Yakushi-ji, near Nara, c.730



22 Vertical section of the east pagoda of Yakushi-ji temple (after Clay Lancaster)

23 Vertical section of Wright's unbuilt St. Mark's Tower project, New York, 1929

24 Vertical section of the Johnson Research Tower, Racine, Wisconsin, 1944

similarly cantilevered Harold Price Tower (1952) as 'the tree that escaped the crowded forest'.⁴⁸

In fact, Yakushi-ji pagoda itself was never intended to be ascended other than for occasional maintenance purposes, and its pent roofs are not actually cantilevered from the central pillar, the primary function of which is symbolic rather than structural, simply marking the resting place of the sacred Buddhist relics which lie beneath its base. Wright himself was probably aware of this. Indeed, his analogy between the pagoda and the pine tree suggests that he may well have combined these two models in generating the concept of the cantilevered tower. However, in the case of the pagoda at least, he would appear to have been applying a form to the Johnson laboratory whose original purpose was not primarily practical at all, and which, in the St. Mark's Tower project, he had himself previously proposed for a quite different, *domestic* programme.

Wright's apparent determination to use the cantilevered tower form for the Johnson laboratory, irrespective of the particular characteristics of the programme, seems to be borne out by the running

battle over the design which he fought with the Johnsons' chief chemist J. Vernon Steinle.⁴⁹ In fact, the Research Tower would appear to be a prime example of how aesthetically motivated design decisions can often be explained on perfectly convincing logical grounds. As Philip Johnson correctly sensed, long before Wright knew anything of the brief for the laboratory he had already decided that any extension to the Johnsons' buildings should take the form of a tower.⁵⁰ However, Wright subsequently justified the decision to expand the complex vertically on the grounds that it minimized the lengths of the many service runs required for the new laboratory.⁵¹ Although this particular idea would appear to have derived from the tree trunk analogy rather than from the pagoda, it was a compelling argument. However, the decision to build vertically also made circulation for *people* considerably more difficult, of course, movement from one laboratory to another generally necessitating using the stairs or an elevator. And as Jonathan Lipman has pointed out, this was no minor inconvenience for a group of scientists involved in closely related research. It was apparently argued

that the mezzanine floors were actually intended to overcome this potential lack of contact.⁵² Yet, delightful though the double-height spaces are, in practice they would seem to have allowed little effective communication between levels, and in fact they added to the fire risk of the building, which in the end proved to be its Achilles' heel as a working laboratory.⁵³

It seems, then, that Wright may well have chosen the cantilevered tower form for the Johnson laboratory on primarily aesthetic grounds, which is not to say that there were no perfectly logical reasons for its use, but simply that in this case the formal motivations would appear to have outweighed the rational. It could, however, still be argued that Wright was employing a reasonable analogy, since the main purpose of the pagoda form itself was symbolic, and for Wright, at least, this would also seem to have been one of the primary functions of the Johnsons' new research facility.

From the above examples, it seems clear that Wright's initial interest in Japanese architectural forms was frequently aesthetically driven. Yet it is equally evident that he was engaged in something quite distinct from simply 'borrowing' forms on aesthetic grounds alone. In fact, his use of these particular forms appears to have been highly selective and generally, although not always, underpinned by a rational analogy. Moreover, far from simply using these forms directly, Wright was clearly subjecting them to a fairly rigorous process of abstraction, after which it is questionable whether they could be described as 'Japanese' any longer.

Without this process of simplification Wright would, of course, have been guilty of simply copying existing forms. However, unless guided by some kind of analogy, no matter how rudimentary, simply abstracting existing forms would have been unlikely to have produced practically useful results. The two processes involved, then, were mutually interdependent, the tacit analogy both determining which forms would be the subject of abstraction, and also setting the parameters for that process of simplification by dictating those elements of the existing form which were relevant to the new context and those which could be discarded.

If one accepts that the essential concept of a building is generally contained in its plan and section, then if Wright was actually drawing rational ana-

logies with Japanese buildings—as opposed to simply adopting their forms on aesthetic grounds alone—most of the similarities between his work and Japanese structures would tend to be at the level of plan and section rather than in superficial details, and this is in fact generally found to be the case. The accuracy of those analogies may in some cases be open to question, but the process itself would seem to be a perfectly legitimate, not to say fundamental creative device.⁵⁴

In his use of these Japanese forms, then, Wright was engaged—as most artists surely must be—in an essentially analogic process leading to new syntheses between previously existing, but separate, concepts and forms. Yet Wright himself had declared that 'Ideas exist for us by virtue alone of form. The form can never be detached from the idea'.⁵⁵ It would have been unthinkable, then, for him to have used a form without regard to the concept which it embodied, and it is this crucial point which seems to have lain behind Wright's fierce objection to what he clearly perceived as Charles Ashbee's 'charge' that he had been *adapting* Japanese forms, the term 'adapting' implying a use of forms *in spite of*, rather than *because of*, the ideas which they encapsulated. Wright would have taken particular exception to this suggestion because developing forms from within the characteristics of the programme itself, rather than imposing them preconceived, was one of the primary distinctions which he drew between his own 'organic' architecture and the superficial historical styles he was so against, as he made quite clear a few years after his disagreement with Ashbee, when he explained: 'By organic architecture I mean an architecture that *develops* from within outward in harmony with the conditions of its being as distinguished from one that is *applied* from without'.⁵⁶

The implication was that if the concept encapsulated by an existing built form was not essentially analogous with the structure of a new programme, then its form could not be appropriate for that programme, and would certainly not be *adapted* to make it so. As we have seen, in his analogies with Japanese forms at least, Wright would appear to have adhered to this principle fairly consistently. Indeed, far from simply borrowing, or even 'adapting' these forms, he was generally engaged in abstracting analogous form-ideas, a quite distinct process carrying with it an implicit awareness—albeit imprecise—of the

essential concepts which these form-ideas embodied.

In the end these examples probably tell us as much about Wright's approach to existing built forms in general as they do about his use of Japanese forms in particular. Indeed, if the terms 'religion' and 'Christianity' are replaced by the words 'architecture' and 'organic architecture' respectively, Wright's general approach to architectural history would seem to have been encapsulated in his summing up of the design of Unity Temple, when, via Pastor Johonnot, he explained: 'Informed by the same spirit which characterized the ancient temples, this structure typifies the thought that "while religions are many, religion is one", and that the vital power and superiority of Christianity consists in its ability to absorb, perfect, and use whatever was good in all preceding forms of religion.'⁵⁷ Ironically, then, in his approach to Japanese forms, it seems that Wright was engaged in a process of creative simplification for which the Japanese themselves have long been noted.⁵⁸

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Notes

This paper is an extract from the author's recently published book *Frank Lloyd Wright and Japan: The Role of Traditional Japanese Art and Architecture in the Work of Frank Lloyd Wright*, Chapman & Hall, 1993, and stems from his doctoral research at the University of Cambridge Martin Centre for Architectural and Urban Studies.

- 1 As late as 1956, for example, Wright was still insisting: 'I found in Japan, not the inspiration which everybody thinks I found . . . What happened to me was a great confirmation of the feeling I had and work I had myself done before I got there.' 'Japanese culture', tape transcript, Taliesin, 5 February 1956. © The Frank Lloyd Wright Foundation. On the role of the woodblock print in Wright's work, see K. Nute, 'Frank Lloyd Wright and the woodblock print: the geometric abstraction of natural, man-made and social forms', *Andon: Journal of the Society for Japanese Arts and Crafts*, vol. 45, 1993, pp. 3–14.
- 2 For more on the relationship between Wright and Ashbee, see A. Crawford, 'Ten letters from Frank Lloyd Wright to C. R. Ashbee', *Architectural History: Journal of the Society of Architectural Historians of Great Britain*, vol. 13, 1970, pp. 64–73, and H. A. Brooks, *The Prairie*

School: Frank Lloyd Wright and His Midwest Contemporaries, W. W. Norton, 1976, pp. 17–18.

- 3 C. R. Ashbee, 'Frank Lloyd Wright: Eine Studie zu seiner Würdigung' (Frank Lloyd Wright: a study and an appreciation), in *Frank Lloyd Wright: Ausgeführte Bauten*, Verlegt bei Ernst Wasmuth A. G., 1911, as reprinted in *Frank Lloyd Wright: The Early Work*, with an introduction by E. Kaufmann, Jr, Horizon Press, 1968, p. 10. On p. 9 of the 1968 Horizon edition it was suggested in a margin note that the section of the introduction containing the comments on Japanese influence was not part of Charles Ashbee's original English script. However, Wright, at least, seems to have held Ashbee responsible (see note 4 below).
- 4 Wright to Ashbee, 26 September 1910, the Ashbee Journals, King's College Library, Cambridge. © FLWF, first published in A. Crawford, 'Ten letters from Frank Lloyd Wright to Charles Robert Ashbee', *Architectural History: Journal of the Society of Architectural Historians of Great Britain*, vol. 13, 1970, p. 69. The comments on Japanese influence caused something of a row between Wright and Ashbee, and it seems that Wright attempted—apparently unsuccessfully—to have the references to Japanese influence omitted from the final publication. He ended his letter: 'Please forward immediately all proofs that may have arrived before my letter to Wasmuth cuts them off.' Wright to Ashbee, 26 September 1910.
- 5 The word *Japonisme* was coined in 1872 by the French art critic Philippe Burty (1830–90), who used it to describe the enthusiasm for Japanese artefacts which had developed in Paris during the 1860s. See P. Burty, 'Japonisme: I', *La Renaissance littéraire et artistique*, vol. 4, May 1872, pp. 25–6, *idem*, 'Japonisme', *The Academy*, vol. 8, no. 170, 7 August 1875, pp. 150–1. Burty subsequently described the equivalent English term 'Japanism' as 'a new word coined to designate a new field of study, artistic, historic and ethnographic'. See *idem*, 'Felix Buhot, painter and etcher', *Harper's New Monthly Magazine*, vol. 76, no. 453, February 1888, p. 334. For a comprehensive view of European Japonisme, see S. Wichmann, *Japonisme: The Japanese Influence on Western Art Since 1858*, Thames & Hudson, 1981.
- 6 The term 'Aesthetic Movement' describes the general heightening of interest in the purely aesthetic qualities of man-made artefacts—in 'art for art's sake'—which emerged in Britain during the 1850s and flourished, primarily in Britain and America, until the mid-1880s. For an account of its origins and leading protagonists, see R. Spencer, *The Aesthetic Movement: Theory and Practice*, Studio Vista, 1972. On the important role played by Japanese art in the Aesthetic Movement, see R.

- Spencer *et al.* (eds), *The Aesthetic Movement and the Cult of Japan*, The Fine Art Society, 1972. On the influence of Japanese art on British aestheticism in particular, see 'The Japanese taste', in E. Aslin, *The Aesthetic Movement: Prelude to Art Nouveau*, Elek Books, 1969, pp. 79–96.
- 7 For an excellent concise account of the impact of Japanese *objets d'art* on French art in particular, see G. Weisberg *et al.*, *Japonisme: Japanese Influence on French Art 1854–1910*, Robert G. Sawers Publications, 1975.
 - 8 For a good account of the graphic side of American Japanism, which includes a good section on Wright's collecting of woodblock prints, see J. Meech & G. Weisberg, *Japonisme Comes to America: The Japanese Impact on the Graphic Arts 1876–1925*, Harry N. Abrams, 1990.
 - 9 A decade after the Exposition, Morse recalled that 'the Japanese exhibit at the Centennial exposition in Philadelphia came to us as a new revelation; and the charming onslaught of that unrivalled display completed the victory. It was then that the Japanese craze took firm hold of us'. E. S. Morse, *Japanese Homes and Their Surroundings*, Ticknor & Co., 1886, Preface, p. xxxvii.
 - 10 The Japanese buildings at the Centennial Exposition were first described in Anon., 'Japanese work at the Centennial grounds', *American Architect and Building News*, vol. 1, 12 February 1876, pp. 55–6.
 - 11 The architectural impact of these structures is discussed by Clay Lancaster in 'Japanese buildings in the United States before 1900: their influence upon American domestic architecture', *Art Bulletin*, vol. 35, no. 3, September 1953, pp. 217–25. For a more extensive account, see *idem*, *The Japanese Influence in America*, Walton Rawls, 1963, which remains the single most comprehensive study of Japanese influence on American architecture. On the role of Japanese art and architecture in the reform of the late nineteenth-century American domestic interior, see V. Scully, Jr, *The Shingle Style: Architectural Theory and Design from Richardson to the Origins of Wright*, Yale University Press, 1955. Also see G. Wilson, 'American Arts and Crafts architecture', in W. Kaplan (ed.), *The Art that is Life: The Arts and Crafts Movement in America, 1875–1920*, Little, Brown & Co., 1987, p. 109.
 - 12 The *ramma* is the ventilating latticework located over openings in the traditional Japanese domestic interior.
 - 13 The *kamoi* is the flat timber plate which acts as a lintel for openings in the traditional Japanese interior, and as an upper runner for the sliding screens, the *fusuma* and *shoji*. On McKim, Mead & White's integration of Japanese elements into their domestic interiors generally, see Scully, *op. cit.*, pp. 133–9. The Newcomb house was first published in D. Appleton & Co., *Artistic Houses, Being a Series of Interior Views of a Number of the Most Beautiful and Celebrated Homes in the United States* . . . , 2 vols., D. Appleton & Co., 1883–4, vol. 2, part I, opposite p. 1.
 - 14 The *irimoya* is a half-gable and half-hipped roof form, the ridges of the latter section having a pronounced curvature. According to Clay Lancaster, the Greene brothers were particularly impressed with the Japanese exhibit at the 1893 World's Columbian Exposition in Chicago, which is discussed later in this paper. See C. Lancaster, *The Japanese Influence in America*, p. 109.
 - 15 For an excellent account of the Greenes' adoption of Japanese details, see Lancaster, *ibid.*, pp. 109–18. However, as several writers have pointed out, the main elements of the Greenes' aesthetic, notably the use of strongly expressed rusticated joinery, owed at least as much to the Arts and Crafts movement and the timber-lodge tradition as to anything from Japan. On the parallels between the Greenes' work and Scandinavian and Alpine timber lodges, for example, see Reyner Banham's Introduction to R. Makinson, *Greene & Greene: Architecture as a Fine Art*, Peregrine Smith Inc., 1977, p. 20.
 - 16 On the general simplification of the American domestic interior during this period, see 'The minimal house', in G. Wright, *Moralism and the Model Home: Domestic Architecture and Cultural Conflict in Chicago 1873–1913*, University of Chicago, 1980, pp. 231–53. On the innovations of Wright's Prairie House in particular, see *ibid.*, pp. 137–8. Interestingly, as early as 1903 a member of the University of Chicago Department of Household Administration was welcoming the 'orientalizing' of American taste 'toward the standards of extreme simplicity which give the charm and aesthetic quality to Japanese home life'. See Annie Howes Barus, 'Order and disorder in the home', *The House Beautiful*, vol. 14, June 1903, p. 53.
 - 17 Although it had been briefly mentioned by others, Grant Manson was the first writer to attempt to analyse the impact of the Ho-o-den on Wright's work. See G. C. Manson, 'Frank Lloyd Wright and the Fair of '93', *Art Quarterly*, vol. 16, no. 2, 1953, pp. 115–23. Similarly, see C. Lancaster, 'Japanese buildings in the United States before 1900: their influence upon American domestic architecture', *Art Bulletin*, vol. 35, no. 3, 1953, pp. 220–2, and more recently, K. Nute, 'The Ho-o-den: the temple and the villa married in South Chicago', *Frank Lloyd Wright and Japan: The Role of Traditional Japanese Art and Architecture in the Work of Frank Lloyd Wright*, Chapman & Hall, 1993, pp. 47–72.
 - 18 The Western equivalents of the various spaces in the central hall of the Ho-o-den had been clearly set out—albeit not entirely accurately—by the locally based architect Peter Bonnet Wight in a contemporary article

- in the *Inland Architect*, in which he explained: 'The main building contains . . . a reception hall, sitting-room, study and dressing-room.' P. B. Wight, 'Japanese architecture in Chicago: Part II', *Inland Architect and News Record*, vol. 20, no. 6, 1893, p. 61.
- 19 In fact, it has been suggested that the traditional Japanese interior played an important part in the development of the open plan in American domestic architecture generally. See Scully, *op. cit.*, pp. 21–2, 135.
 - 20 Wright, *Modern Architecture, Being the Kahn Lectures for 1930*, Princeton University Press, 1931, as reprinted in *Frank Lloyd Wright. Writings and Buildings*, selected by E. Kaufmann & B. Raeburn, Horizon Press, 1960, pp. 43–4.
 - 21 Wright was sufficiently impressed to return to Nikko, and to the Kanaya Hotel, in December 1918. See M. Tanigawa, 'Kanaya Hoteru Register Book ni Mirareru Wright no Tōshūki Kiroku' (Evidence of Wright's stay from examination of the Kanaya Hotel Register book), *Architectural Institute of Japan Hokkaido Branch Research Bulletin*, no. 42, 1975, pp. 251–4. On Wright's activities in Japan generally, see K. Nute, 'Frank Lloyd Wright in Japan: giving and receiving in "Yedo"', *Scroope: The Cambridge Architecture Journal*, vol. 5, 1993, pp. 64–71.
 - 22 Wright was unusual amongst foreign architects in being able to get beyond the surface treatment of the buildings at Nikko to appreciate their underlying forms. Three decades later, for example, the German modernist Bruno Taut was completely put off by the decorative scheme of the Toshō-gu, which he described as 'barbaric overloaded baroque' and contrasted unfavourably with the restrained aesthetic of Katsura Rikyu, a perception which has persisted amongst succeeding generations of Western architects. See B. Taut, *Houses and People of Japan*, John Gifford, 1938, pp. 261, 299. Apparently influenced by his compatriot's view, for example, Walter Gropius later drew a similar contrast between the Nikko Toshō-gu and Katsura Rikyu. See W. Gropius, *Apollo in the Democracy: The Cultural Obligation of the Architect*, McGraw-Hill, 1968, p. 128.
 - 23 The Wrights' return from Japan was announced in their local paper, the *Oak Park Reporter* (Oak Park, IL), 20 May 1905, p. 4. The destruction of the Unitarian church took place three weeks later in the early morning of Sunday 4 June, and was reported in 'Unity church fire', *Oak Leaves* (Oak Park, IL), 10 June 1905, p. 1.
 - 24 I am indebted to Masami Tanigawa for first pointing out this similarity to me in June 1987. Wright's appointment as architect for the new church was reported in *Oak Leaves* (Oak Park, IL), 16 September 1905, p. 13. He subsequently presented slides and a plaster model of the proposed building to about seventy-five of the churchmen on 31 January 1906. See 'Unity church men see plans', *Oak Leaves* (Oak Park, IL), 3 February 1906, p. 12. A few weeks later the new church design was featured again. See 'Unity plans unique', *Oak Leaves* (Oak Park, IL), 24 February 1906, p. 3.
 - 25 The plans of the Larkin Building (1904) and the Guggenheim Museum (1956), for example, also seem similar to the *gongen parti*. However, the first of these had actually begun on site a full year before Wright visited Nikko, and Jack Quinn, who knows more about the construction of the Larkin Building than most, informs me that to his knowledge there were no major changes to the design during 1905.
 - 26 P. Blake, *Frank Lloyd Wright. Architecture and Space*, Penguin, 1964, p. 50.
 - 27 R. Jonhnot, in *The New Edifice of Unity Church, Oak Park, Illinois, Frank Lloyd Wright, Architect. Descriptive and Historical Matter by Dr. Rodney F. Jonhnot, Pastor*, The New Unity Church Club, 1906, reprinted edn, Oak Park Unitarian Universalist Church, 1984, p. 3. Although Pastor Jonhnot is named as the author of this descriptive booklet, Wright was listed as a member of the three-man committee on the brochure, and his influence is evident throughout. It may have been considered diplomatic to name the pastor as author in order to bolster the credibility of the design with the church members, some of the more conservative of whom were initially less than enthusiastic.
 - 28 The mixing of Shinto and Buddhist architectural forms was common during the Edo period (1603–1868) when the unification of the two belief systems was a deliberate policy. Hence the Taiyū-in is a temple with an essentially shrine form and the Toshō-gu is a Shinto shrine with several Buddhist architectural features. This policy was reversed after the restoration of the Emperor in 1868, after which Shinto was adopted as the national religion and all temples and shrines were obliged to revert to one or other creed.
 - 29 Jonhnot, *op. cit.*, pp. 2–3.
 - 30 *Ibid.*, p. 3.
 - 31 *Ibid.*, p. 8.
 - 32 Frank Lloyd Wright, *An Autobiography*, Faber & Faber and Hyperion Press, 1945, p. 139.
 - 33 Jonhnot, *op. cit.*, p. 8.
 - 34 Pastor Jonhnot explained: 'The site of the building is a corner lot having a frontage of 100 feet on Lake street, the main street of Oak Park, and a depth of 170 feet on Kenilworth avenue.' *The New Edifice of Unity Church*, *op. cit.*, p. 5. Concerning the size of the building itself, he continued: 'The depth of the whole structure on its main axis running through the Entrance Hall is 143 feet.' *Ibid.*

- 35 Wright, *An Autobiography*, 1945, op. cit., pp. 139–40.
- 36 Wright, 'Designing Unity Temple', *An Autobiography*, Longman, Green & Co., 1932, as reprinted in Kaufmann & Raeborn (eds), *Frank Lloyd Wright: Writings and Buildings*, op. cit., pp. 77–8.
- 37 I have borrowed this term from Geoffrey Broadbent, whose analysis of the designing of Unity Temple provided the inspiration for the current one. See G. Broadbent, *Design in Architecture: Architecture and the Human Sciences*, John Wiley, 1973, pp. 40–3.
- 38 Wright, 'Designing Unity Temple', *An Autobiography*, 1932, op. cit., p. 82.
- 39 Ibid., p. 77.
- 40 Wright had earlier suggested: 'It would carry us far from our subject if we should endeavor to render an accurate, convincing account of the reason why certain geometric forms have come to symbolize for us and potentially to suggest certain human ideas, moods, sentiments,—as for instance: the circle, infinity; the triangle, structural unity; the spire, aspiration; the spiral, organic progress; the square, integrity.' *The Japanese Print: An Interpretation*, Fletcher Seymour, 1912, pp. 6–7.
- 41 Wright, *An Autobiography*, 1932, op. cit., p. 75.
- 42 E. S. Morse, *Japanese Homes and Their Surroundings*, Ticknor & Co., 1886. On the general influence of Morse's book on Wright's domestic work, see 'Japanese Homes: the Japanese house dissected', in Nute, *Frank Lloyd Wright and Japan*, op. cit., pp. 36–46.
- 43 Morse, who had apparently stayed in this particular house, commented: 'The absence of nearly all furniture gives one an uninterrupted sweep of the floor, so that the entire floor can be covered with sleepers if necessary,—a great convenience certainly when one has to entertain unexpectedly a crowd of guests over-night.' *Japanese Homes and Their Surroundings*, op. cit., p. 112.
- 44 For a fascinating account of this parallel, and of biological analogies in architecture generally, see P. Steadman, *The Evolution of Designs: Biological Analogy in Architecture and the Applied Arts*, Cambridge University Press, 1979, pp. 103–23.
- 45 See Lancaster, *The Japanese Influence in America*, op. cit., p. 162. There were originally twin pagodas at Yakushi-ji, but the west one was destroyed by fire during the sixteenth century and was only rebuilt after Wright's time in Japan. Interestingly, Wright's East Coast contemporary, the Gothic Revivalist Ralph Adams Cram, had been similarly impressed with the pagoda at Yakushi-ji, having described it as 'one of the most daring, original and yet successful works of architecture in Japan'. See R. A. Cram, *Impressions of Japanese Architecture and the Allied Arts*, Baker & Taylor Co., 1905, pp. 37–8.
- 46 Jonathan Lipman has suggested a very plausible alternative source for the staggered section of the St. Marks Tower project in a 1927 cartoon by Buckminster Fuller 'Zeppelin Delivery of 4-D Houses'. See J. Lipman, *Frank Lloyd Wright and the Johnson Wax Buildings*, Architectural Press, 1986, p. 12. However, there was no central core in Fuller's tower, so the question arises of whether Wright might have combined these two disparate sources.
- 47 Wright suggested: 'The pagodas of China and Japan definitely resemble the pines with which they were associated.' *The Future of Architecture*, Horizon Press, 1953, p. 45. In fact, the pagoda form is thought to have derived from the spire of the Indian stupa, although some believe that the Japanese version may have developed from a combination of this Buddhist form with the Shinto idea of the sacred tree or pillar. Whatever the case, Wright's analogy with the pine tree would seem to provide a clue to the origin of the structural service core of the Johnson Research Tower.
- 48 See Wright, *The Story of the Tower: The Tree that Escaped the Crowded Forest*, Horizon Press, 1956.
- 49 The battle of wills between Wright and Steinle is described by Lipman in *Frank Lloyd Wright and the Johnson Wax Buildings*, op. cit., pp. 121–44, where the author reports Steinle and his fellow chemist Edward Wilder as having been generally pleased with the final outcome, but adds that 'they felt that they would have been equally satisfied with a conventional laboratory building, and that almost every way in which the building varied from conventionality imposed some compromise on them'. Ibid., p. 159.
- 50 Johnson suggested of the research tower that 'it was the terrific problem of a man who wants a beautiful building but the only thing he has to build is a laboratory. Wright puts it into a tower. It doesn't work; it doesn't have to work. Wright had that shape conceived long before he knew what was going into it' 'On the responsibility of the architect', *Perspecta, The Yale Architectural Journal*, vol. 2, 1953, p. 47, as quoted by Kenneth Frampton in *Modern Architecture: A Critical History*, Thames & Hudson, 1985, p. 245. Johnson's perception has since been confirmed by Jonathan Lipman; see *Frank Lloyd Wright and the Johnson Wax Buildings*, op. cit., p. 122.
- 51 See 'Genesis of the research tower', in ibid. pp. 122–3.
- 52 See ibid., p. 159.
- 53 On the persistent concern over the tower's fire safety see ibid., pp. 164, 167.
- 54 For a perceptive account of the role of analogy in the creative process generally, see A. Koestler, *The Act of Creation*, Picador, 1969. For a good discussion of the use of analogy specifically in relation to architectural

design, see Broadbent, *Design in Architecture*, op. cit., pp. 30–5.

55 Wright, *The Japanese Print*, op. cit., p. 11.

56 Wright, 'In the cause of Architecture: second paper', *Architectural Record*, vol. 35, no. 5, 1914, as reprinted in F. Gutheim (ed.), *In the Cause of Architecture: Frank Lloyd Wright*, Architectural Record and McGraw-Hill, 1975, p. 122, footnote.

57 Jhonnot, op. cit., p. 16.

58 For further discussion of this topic, see K. Nute, 'Frank Lloyd Wright and the arts of Japan: a study in how to borrow properly', *Architecture and Urbanism*, no. 233, February 1990, pp. 26–33.