

Vorticism and Architecture

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In 1934, commenting on the former brief ascendancy of the Vorticist movement in Britain, Wyndham Lewis said that Vorticism had been, ‘in a sense, *a substitute of architecture for painting*’ (his italics). For him, ‘the Vorticist was peculiarly preoccupied with the pictorial architectonics at the bottom of picture-making’, but also ‘aimed essentially at an *architectural reform*’ (WLA 278). In support of this contention Lewis referred to his extended utopian fantasy *The Caliph’s Design* (1919), his first post-war critical essay (and effectively his last piece of writing purposively Vorticist). Its sub-title, ‘Architects! Where is your Vortex?’, in effect challenged architects to engage themselves in the underlying purposes of Vorticism already manifested in the plastic arts before the First World War. In his underlying argument Lewis proposed, within the ‘great Trinity, Sculpture, Painting and Architecture’ (CD 10), to substitute the term ‘Design’ for the word ‘Architecture’ (and, by implication, the word ‘Designer’ for the word ‘Architect’). ‘*You must get Painting, Sculpture and Design [the retitled ‘great Trinity’] out of the studio and into life somehow or other*’ (CD 12). Thereafter the ‘Engineer and the Painter [should] fix up a meeting and talk over the sadly-involved affairs of this decayed concern [...] [and] divide up this “ramshackle Empire” of Architecture’ (CD 11) – a proposition unlikely to encourage any architect to go looking for his ‘Vortex’, even with Lewis’s subsequent proviso: ‘There is no reason why there should not be a certain number of interesting architects’ (CD 33), which he thought his pamphlet might bring forth.

The Greek *architekton* had supervised the artisan craftsmen (*tektones*). The implicit (or explicit) class distinction in this terminology (‘designers’ being, in the general understanding, artisan craftsmen) received a strong historical impetus in both Roman and Renaissance times. Vitruvius, the Roman who came to dominate Renaissance thinking on the subject, regarded the architect as a ‘man of letters’. Architects had augmented their professional standing during the Renaissance by elaborating on the common interest of architecture and music in matters of harmonic proportion. Rudolf Wittkower makes the point that ‘Palladio took the greatest care in employing harmonic ratios

not only inside each single room, but also with the relation of the rooms to each other, and it is this demand for the right ratio that is at the centre of Palladio's conception of architecture'.¹

'Design' has meant different things for different crafts, providing, according to one account, a 'figurative utopia', as in essence does *The Caliph's Design*. More specifically:

In the applied arts, design is the pattern for making a product. In the fine arts, design is the creative process of producing a work of art. In engineering, design is an exact calculation for the working of particular parts to form a whole. In architecture, design encompasses all the processes from the choice of structure to the details of the interior.²

In this matter Lewis had some important forerunners. The Art Workers' Guild, set up in 1884 largely among some of the staff in the architectural office of Norman Shaw (notably W. R. Lethaby), had early ambitions to reform the prevalent design of the day.³ In 1889, in an address to the Architectural Association, Lethaby said: 'It is the power to embody the old principle [in] ever-new conditions, distinguishing and setting aside that which does not form part of the living thought of the time, which is the true objective of the architect'.⁴ In 1896 he became the Principal of the Central School of Arts and Crafts in London, and in 1900 he was appointed as the first Professor of Design at the Royal College of Art. He also played a prominent role in setting up the Design and Industries Association in 1915, a body created to integrate art with industry, commerce, and education, partly in imitation of the *Deutsches Werkbund*, created in 1907 as 'the most powerful and important society devoted to design and commodity culture in early twentieth-century Germany'.⁵

In *The Caliph's Design* Lewis cited Lethaby's *Architecture: An Introduction to the History and Theory of the Art of Building* (published in 1912): 'the best treatise I have so far come across [on the subject], [...] as sound a book as possible' (CD 45). Lewis quoted Lethaby with approval: "'The modern way of building must be flexible and vigorous, even smart and hard. We must give up designing the broken-down picturesque which is part of the ideal of make-believe. The enemy is not science, but vulgarity, a pretence to beauty at second hand'" (cited in CD 45). For Lewis, the 'imitative side' of the conventional practice in architecture fuelled his contempt for the 'well-paid *pasticheur*, who

restores a house or runs one up, in Tudor, Italian, or any other style' (CD 43), a process described by the German critic Hans Schliepmann as 'the pasting up of inherited styles on the framework of a functional construction'.⁶ Lewis's suggestion that the Engineer and the Painter should divide up the 'ramshackle Empire' of the Architect was less part of a utopian fantasy than a solicitation. His contemporary, the French author Amedée Ozenfant, argued that '[t]he only difference between Painting and Sculpture and Architecture is that of technic. Painting works with the illusion of space, while Sculpture and Architecture work with space itself.' Ozenfant distinguished 'Free Architecture' ('Sculpture on a large scale') from Utilitarian Architecture ('One of the functions of the engineer').⁷ By contrast, Lewis's proposed dividing-up of Architecture between the Painter and the Engineer had disobligingly left the Sculptor in the cold, as also any claims for such callings as 'interior design', or 'landscape architecture'.

A less divisive approach to the issues raised in *The Caliph's Design* had been developed contemporaneously (in 1917-18) by the Dutch movement De Stijl, mainly on the initiative of Theo van Doesburg, the editor of its eponymous journal. For De Stijl 'architecture became the collective product of artists and technicians – painters, sculptors, architects and engineers. An easel painting was no more than a guiding example and object of meditation – a kind of mathematical and technological icon'.⁸ Lewis was probably unaware of De Stijl's proposals at the time he compiled *The Caliph's Design*. In his study of *Pioneers of Modern Design*, Nikolaus Pevsner wrote of the later nineteenth century: 'The complete abandonment of borrowed architectural elements and ideals could not come from the architects. It came from the engineers.'⁹ In twentieth-century technological conditions, engineers could aspire to become *primus inter pares*. Two books published in Germany in 1906, Edward Mayer's *Technik und Kultur* and Ulrich Wendt's *Die Technik als Kulturmacht* (i.e. *Technology as a Cultural Force*), argued the case for engineering technology as the potential driving force for a modern re-expression of 'spirituality'.¹⁰ Julius Schenk, Professor at the *Technische Hochschule* in Munich, published the text of his academic lectures in 1912, contending that engineers and creative artists both dealt with 'creative forms and images' and that 'it was time for engineers to give up their inferiority complex concerning the humanities'.¹¹ In the eyes of the English architect and author H. S. Goodhart-Rendel, they did so with such effect in securing a 'heightened status' or 'enlarged scope' for the

engineer in the making of new buildings post-1910 (or post-1920) via the doctrine of 'functionalism' that he spoke of the 'preferment of engineering' as characteristic of the period's architectural activity.¹²

In his autobiography *Rude Assignment* (1950), written three decades after *The Caliph's Design*, Lewis dismissed the earlier book as 'mostly rough notes; not planned but written down hastily, from time to time, as some problem presented itself. [...] I had not then the necessary experience, in any case, to marshal my arguments in the most effective way' (RA 168). Paul Edwards, editing *The Caliph's Design* in 1986, takes a more enthusiastic view of the original, seeing it as 'of central importance to an understanding of Modernism in the arts' (CD 146). To grasp the basics of modernism, and the role of the designer (or architect) therein, we need to look first to Vorticism's immediate antecedents, Cubism, Expressionism, and Futurism. Along with Vorticism itself, they provided what Lewis in 1929 called 'the tornado [...] [that] left art better than it found it' (WLA 257). But they, too, had predecessors.

Art Nouveau and Architectural Modernism

A discernably 'modernist' architecture emerged in the 1890s in the style that became known as 'Art Nouveau'. Its first notable achievement, Victor Horta's Hôtel Tassel in Belgium (1892/3) made an extensive use of iron in a work of domestic architecture as 'an organic filament insinuated into the fabric to subvert the inertia of stone'.¹³ Anne Massey elaborates the point:

Horta does not disguise the metalwork infrastructure of the house but incorporates it into the design. In the hall, for example, the supporting metal column of the stair and the beams are embellished with swirling metal tendrils, and the same organic forms are painted on the wall, carried out in mosaic on the floor and repeated in the metal light-fitting and bannister.¹⁴

This development had been preceded by two symbolic works of architectural engineering associated with the 1889 Paris World Exhibition: Gustave Eiffel's monumental Tower, which 'invaded the sacred domain of culture with a feat of engineering construction, divested of all functional utility', other than as a monument. Close by,

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the Exhibition's Gallery of Machines 'composed entirely of wrought-iron beams and glass panes', a horizontal counterpiece to the Tower's dominating verticality.¹⁵ But, as they evolved over the ensuing decade, 'the terms "art nouveau" and "modern style"' had by 1900 arguably come to identify architectural forms and meanings 'antithetical to those they signified in 1889', transforming the 'public iron monument' into a 'private iron ornament [...] [which] celebrated modernity in domestic ensembles of nature and interiority'; a 'visionary irregularity' replacing 'standard rational plans' as 'the carrier of modern expression'.¹⁶

For Nikolaus Pevsner 'the programme [behind Art Nouveau] was to get out of historicism into a new style for a new century', a programme which, in part, 'led from Art Nouveau into the short-lived architectural Expressionism', which Pevsner depicts as a 'blind alley'.¹⁷ For him the 'royal road' took architecture in the direction where it 'shed not only historicism but also all embellishments'. That meant (for him) that the 'new style was achieved' before 1914 by such architects as Peter Behrens and Walter Gropius, whose pre-war work (such as the AEG Turbine Hall and the Fagus factory) laid the foundations of International Modernism in the early post-war period. However, Gropius's name (and that of the Bauhaus, of which he became the influential Director) was also closely associated with architectural (and design) Expressionism.

Architectural Expressionism

In 1898 the architect August Endell expressly identified the break from the prevalent historical eclecticism of nineteenth century architectural thinking with the coming of Art Nouveau and its Munch variant *Jugendstil*: 'We stand at the threshold of an altogether new art, an art with forms which mean or represent nothing, recall nothing, yet which can stimulate our souls as deeply as only the tones of music have been able to do'.¹⁸ Young architects were not isolated from these new developments. The founding members of what is generally accepted as the first clearly 'Expressionist' group of artists, Dresden's *Die Brücke* (1905), had all been students of architecture. The term 'Expressionism' has no indisputable meaning, being popularized by an article in Helmut Walden's Berlin art journal *Der Sturm* in 1911. Because Expressionism manifested itself in painting and the graphic arts, and also in sculpture,

architecture, literature, drama, cinema, music, and even as a ‘philosophy of life’, indeterminacy readily took hold of any explanation. Paul Raabe later distinguishes between ‘The Early Years 1910-14’ and ‘During and After the War 1915-20’, although *Die Brücke* began in 1905, and not all Expressionist effort ceased after 1920. A distinction between the pre-war and later periods is nevertheless justifiable. The political edge had sharpened, even if Expressionism retained its aura of ‘utopian fantasy’, as in Bruno Taut’s Pavilion for the Glass Industry (Cologne 1914) and Hans Poelzig’s *Großes Schauspielhaus* (Berlin 1919).

The ‘crisis’ for Expressionist architecture – at least in its primary home, Germany – emerged at the end of 1918 and in early 1919, when the newly-formed *Arbeitsrat für Kunst* (Workers’ Council for Art), founded in the brief post-war spell of enthusiasm for a conciliar (or soviet) social organization, acquired a strong Expressionist element and whose ‘controlling spirits [...] were not the Expressionist painters but the architects’, who included not only Taut and Poelzig, but also Walter Gropius, who became its president. The emphasis the Council gave to matters of mainly architectural interest came out in its initial programme, which demanded ‘the recognition of the public nature of all building activity’ and required ‘permanent experimental sites, for assessing and improving architectural effects’ and ‘the removal of all aesthetically worthless monuments and the demolition of all buildings whose artistic value is disproportionate to the value of their raw materials’.¹⁹ A determined Caliph would have been a necessary adjunct, as Lewis recognized in his own ‘utopian fantasy’.

Predictably, the *Arbeitsrat* entered Pevsner’s ‘blind alley’, but its leading architectural figures made individual impacts on the 1920s, not so much renouncing Expressionism as resolving its inherent contradictions by allowing the modern technical demands of an industrial society to override, but not destroy, the sense of a spiritual necessity. Bruno Taut, the arch-idealist, became the chief designer of the Berlin building society Gehag – a fief of the dominant Social Democratic administration there – from 1923 to 1932, where he was able to put into effect some of his ideas about the social responsibilities of architecture. Hans Poelzig, Professor at the *Technische Hochschule* in Charlottenburg from 1924 to 1933, designed, as well as a series of commercial buildings and cinemas, model housing schemes, community centres, and so forth. Walter Gropius, who became Director of the Weimar (later Dessau) Bauhaus in 1919, contributed notably to the

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merging of architectural Expressionism into the mainstream International Style of the later 1920s. Most of the senior teaching staff (Masters of Form) appointed by him in the early years were painters or sculptors with pre-war Expressionist reputations (Feininger, Kandinsky, and Klee notable among them). As Shearer West records:

the Bauhaus was a creative institution, which encouraged some of the Expressionist enthusiasms that prevailed immediately after the First World War. These Expressionist elements in Bauhaus theory and practice seem to distinguish it from the more pragmatic economic concerns of the Werkbund, but throughout the early years of the Bauhaus revolutionary idealism competed with the knowledge that the economy had collapsed and rejuvenation of Germany through the latest technology was felt to provide one answer to this problem. Thus, underlying Gropius's idealism were strands of practicality which eventually suppressed the initial spirit of the Bauhaus.²⁰

However, the Bauhaus organization did not get rid of the historic class-differences of the artistic world. All three successive Directors before its politically-enforced closure in 1933 were architects by profession. The Masters of Form, predominantly painters or sculptors, reputedly showed little interest in the collaborative Workshops which were intended as an integral part in the students' training, while several of the Workshop Masters (notionally equals) 'failed to welcome the artistic direction offered by those Masters of Form prepared to provide it'.²¹

Architectural Cubism

Like 'Expressionism', Cubism began (in 1908) as a term of convenience for a painterly activity. If Expressionism can stand – in a Nietzschean context appropriate to its date – for Dionysian forms of early modernism in the arts, Cubism represents an Apollonian presence. The M.I.T. volume of collected essays *Architecture and Cubism* (1997) details a range of possible usages from 'a kind of shorthand for whole areas of modern experimental painting, sculpture, and construction' to activities 'exclusively concerned with the analysis of the conditions of pictorial representation, and their deliberate subversion, carried out by Picasso

and Braque'.²² Even that latter, narrow definition – which would implicitly rule out a Cubist architecture – has been challenged. Michael Baxendall, for example, suggests that the 'minor Cubists', such as Gleizes, Metzinger, and Delaunay, rather than Picasso and Braque, 'have best title to being called Cubists; they felt the need to be part of a group movement with an explicit programme', unlike Picasso and Braque, who did not, for instance, participate in the Cubist Room in the 1911 *Salon des Indépendents*.²³

Yves Alain Bois cites the 'half-realized project' in 1912 by Duchamp-Villon of a *Maison Cubiste* as 'the first attempt at expanding "cubism" to the field of architecture' and, in so doing, 'producing a nineteenth-century version of a Louis XIV *hôtel particulier* with specks of angular facetting', a style to which he suggests the word 'cubistic' might be appropriate (as it is to many modern buildings which merely incorporate such features as flat roofs, ribbon windows, and large expanses of glass without a purposive Cubist use of space).²⁴ Douglas Cooper makes a comparable assessment: 'a tame, uninspiring effort. The building was an asymmetrical eighteenth-century type pavilion which had singular, prismatic moldings in the place of swirling rococo curves, while the interior (to judge by photographs) was an uncomfortable blend of up-to-date art nouveau and the latest in painting'.²⁵ If we accept the *Maison Cubiste* as merely 'cubistic' – reasonably enough on the basis of photographic evidence – we confront the issue: what specific architecture would merit the term 'cubist'?

The index to the M. I. T. volume gives, by a wide margin, more column inches to Le Corbusier than to any other individual or any specific topic. The irony here is that Le Corbusier's fame as an architect comes from the work he did after he had co-authored with Amedée Ozenfant in 1918 the volume *Après le Cubisme*, which argued, in essence, that Cubism was *passé*, a fact which, as Beatriz Colomina observes, 'is normally omitted' from the accounts given by 'most historians and theorists of architecture'.²⁶ *Après le Cubisme* describes Cubism as 'too decorative', 'too chaotic', 'the troubled art of a troubled epoch', 'individualistic', 'romantic', 'uncertain of its way', 'ornamental', 'obscure', 'extremely confused', and so on. Against that, Ozenfant and Le Corbusier offered a stripped-down Purism, 'the characteristic of the modern spirit, the research of all efficiency'.²⁷ As one who so firmly turned against Cubism, Le Corbusier cannot sensibly represent a 'Cubist' architecture, but rather, as Ozenfant suggests, through Le

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Corbusier's 1923 book *Vers une Architecture*, 'Purism in architecture has influenced the whole world.'²⁸ Interestingly, the Purist critique has points of similarity with Lewis's observations on Cubism before and after the publication of *Après le Cubisme*. In his 'Review of Contemporary Art', which was published in the second volume of *BLAST* in 1915, Lewis wrote that 'the rest of [Picasso's] Cubist colleagues [...] are mostly converted Impressionists, and inclined naturally to cube over their first effort, merely, instead of making any fresh start' (B2 39). And 'the great licence Cubism affords tempts the artist to slip back into facile and sententious formulas, and escape invention' (B2 40).

David Cottingham notes that 'architecture was not seen as integral to the project of cubism either by the majority of cubists themselves or by the movement's critics'. The *Maison Cubiste* showed 'how little cubism, in its original manifestation, had to do with architecture; decorative art, by contrast, was a burning issue. No architect, other than Auguste Perret, frequented the milieu of the Cubist avant-garde, and, other than Duchamp-Villon, 'no member of that avant-garde was tempted to extend cubist ideas on painting and sculpture into the field of architecture'.²⁹ By contrast, in the Czech-speaking provinces of the pre-war Austro-Hungarian Empire an autonomous Czech Cubism 'embraced architecture, design and the decorative arts and flourished most prolifically in the years immediately preceding, and following, the outbreak of the First World War'.³⁰ A more radical departure from Parisian Cubism developed in Holland, led by the De Stijl movement, already mentioned. Its best-known member, Piet Mondrian, thought that Cubism 'did not accept the logical consequences; it was not developing towards its own goal, the expression of pure plastic form'.³¹

Among the architects associated with De Stijl, J. J. P. Oud and Gerrit Rietveld stand out. Of Oud (1890-1963), John Furse says:

Of all the leaders of the Modern Movement it is the Dutchman J. J. P. Oud with his early method based on the mass-production and standardization of inexpensive working-class housing that has meant most to many of today's leading architects. A founder member of De Stijl group, Oud developed a style that is firmly that of the interrelationship of horizontal and vertical planes first understood by the Cubist painters and culminating in the severely geometric designs of the Neoplastic art of fellow De Stijl artist Piet Mondrian [...]. [A] sympathetic amalgam of [Frank Lloyd]

Wright and analytical Cubism led Oud to an essentially abstract conception of architecture and an intense distrust of the previous concern with handcraft detailing. This he saw as mere sentiment and even worse – “expressionistic”.³²

Gerrit Rietveld (1888-1964) is best known for the epochal house near Utrecht designed for Mrs T. Schroder-Schrader in 1924, identified by Richard Weston as ‘the first building to match the widely shared post-war dream of a new world, rebuilt from the ground up on new aesthetic, social and political principles’. In Weston’s account, for the first time we see the idea of the house as a continuous spatial field fully realized, where ‘the space can be transformed by sliding and folding partitions and furniture, and is articulated by coloured planes’, a ‘cubist architecture’ that dispensed, as far as possible, with the cube. ‘Every detail’, Weston writes, ‘reflected the organizing principle of the house: the definition, but not the containment, of space by sticks and planes’.³³

Architectural Futurism

Futurism originated with the Italian poet Marinetti’s ‘Manifesto of Futurism’, published in Paris in February 1909, as a ‘violently upsetting incendiary manifesto’ aimed against ‘professors, archaeologists, *ciceroni* and antiquarians’.³⁴ Other Futurist Manifestos followed, including in 1910 a ‘Manifesto of Futurist Painters’, which was programmatic rather than a text which identified existing work. ‘For over a year’, Douglas Cooper comments, ‘the Futurists continued to work with such pictorial means as they were familiar with, straining the Divisionist technique of colour and the Symbolist use of linear rhythms to their expressive limits.’ In mid-October 1911 a party of them from Milan visited Paris and subsequently ‘reworked unfinished canvases and conceived new ones in a modified style’.³⁵ Until 1914 no manifesto covered architecture. Then Carlo Carrà, a signatory of the painters’ manifesto, introduced Antonio Sant’Elia, an architect belonging to the *Nuove Tendenze* (New Tendency) group, which ‘had a Futurist air, but its more cautious nature and conservative tone laid it open to the mocking label of “right-wing Futurism”’.³⁶ Sant’Elia, abetted by Marinetti, then produced a ‘Manifesto of Futurist Architecture’, published in Florence in March/April of 1914, promising an ‘architecture of calculation, of

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audacious temerity and of simplicity; the architecture of reinforced concrete, of steel, glass, cardboard, textile fibre, and of all those substitutes for wood, stone and brick, that enable us to obtain maximum elasticity and lightness; [...] From an architecture conceived in this way no formal or linear habit can grow, since the fundamental characteristics of Futurist architecture will be its impermanence and transience'.³⁷

This declaration of impermanence owed more to Marinetti's dynamic vision of Futurism than to Sant'Elia's professional ambitions. Killed in 1916, he left no completed work other than a villa built before he joined the Futurists, but he bequeathed architectural drawings that secured him an important place in twentieth-century architectural design. As described by Giovanni Lista:

Its starting point would no longer be the individual building, but the context of large city centers. In his drawings, the city appears as a complex, three-dimensional structure, criss-crossed by constantly moving elements. Sant'Elia studied groups of interconnected buildings, crossed on several levels by the large communication axes of the urban network. Following the Futurist esthetics of the dynamism of the machine, he introduced in the space of the "new city" the most characteristic elements of industrial landscape: elevators climbing up facades, iron bridges and elliptical arcades, towers shaped like plant chimneys, large slanting surfaces similar to the sloping falls of hydro-electric plants, perspectives showing the city aligned on the arrival of the main railroad tracks.³⁸

Sant'Elia apart, the two best-known contributors to Futurist architecture, Enrico Prampolini and Virgilio Marchi, made international reputations in theatre design, a mode particularly appropriate to the ideal of 'impermanence and transience'. After 1922, in the 'search for a representational language evocative of the fascist new era' in the more durable forms of architecture, the young Milanese Gruppo 7, emphasizing 'a strict adherence to logic and rationality', found Futurism's 'contrived impetus' a weakness. From 1926 they were the most influential modernist force, producing such notable work as Terragni's *Casa del Fascio* in Como (1932), a building described by Kenneth Frampton as 'at once tectonic, meticulous and monumental'.³⁹

After 1917 the members of the autonomous Russian Futurist movement turned towards an engineering-inspired Constructivist aesthetic. In so doing they contributed to ‘the abrupt arrival of Russian architecture at the forefront of European design’, although economic and political conditions meant that few Constructivist projects proceeded beyond the design stage.⁴⁰ For Frampton ‘it was the revolutionary Russian Constructivists, but not the Italians, who took up the early militant modernism of Marinetti, Boccioni and Sant’Elia’.⁴¹

Architects: Where Was Their Vortex?

If, apart possibly from Czech Cubism, none of the three art movements which permeated Vorticism – Expressionism, Cubism, and Futurism – made significant direct contributions to modern architecture’s development between the 1890s and 1950s, what of Vorticism itself? On the basis of *The Caliph’s Design* – the nearest we have to a ‘Vorticist manifesto’ for architecture – Lewis (and perhaps some of his associates) did have aspirations to that end. The known works of the half-dozen artists specifically named as members of the Vorticist group at the London Vorticist Exhibition in June 1915 support Lewis’s later contention that ‘the Vorticist was peculiarly occupied with the pictorial architectonics at the bottom of picture-making’ (*WLA* 278). In that they were not alone. On the other side of Europe, separated by a continent at war, the Russian Cubo-Futurist painter Liubov Popova produced oil paintings in 1917-18 comparable with those of the Vorticists, exhibited as ‘Painterly Architectonics’ or ‘Spatial-Force Constructions’. It is less clear that the Vorticist painters ‘aimed essentially at an architectural reform’, given the following caveat (also dating from 1915) of the Swiss-German art historian Heinrich Wölfflin: ‘Painting *can*, architecture *must*, be tectonic. [...] What in painting belongs to tectonics is only the frame’.⁴² This argument was not overlooked by Lewis in 1934 in his account of the Vorticists’ activities: ‘in the heat of this pioneer action we were even inclined to forget *the picture* altogether in favour of *the frame*, if you understand me’ (*WLA* 278).

Construed as a manifesto to win over architects to the ideas already promulgated by Vorticist painters (and the sculptor Gaudier-Brzeska), *The Caliph’s Design* suffered an ambiguity of purpose. As noted earlier, the proposal that painters and engineers should ‘get together’ to

attack the ‘ramshackle Empire’ of the architectural profession would hardly attract a sympathetic response among architects. As well as this ambiguity of purpose, the timing of Lewis’s pamphlet was unpropitious. It appeared in October 1919, at least partly as a call to architects to ‘discover their Vortex’. By March 1920, or earlier, Lewis had, on his own account, ‘stepped out’ (*WLA* 455) of Vorticism. That quick footwork, and its consequences, separated Vorticism from those modern art movements that did directly contribute to the formation of modern architecture: De Stijl, Purism, and Constructivism. Of these, De Stijl offered the closest conceptual match to the ideas Vorticism had been promulgating in and around 1914, with the significant difference that, from its inception in 1917, De Stijl included architects among its more active adherents. The points of similarity are nevertheless important. De Stijl’s most eminent painter, Piet Mondrian, pursued the ideal of a ‘dynamic equilibrium’, comparable with the Vorticist ideal of a ‘maximum point of energy when stillest’ (*B1* 148). Mondrian’s personal search for this ‘dynamic equilibrium’ led him to the view that the ‘rightness of proportions and relations’ in his notably geometrical paintings ‘depended on intuition alone’.⁴³ This view was paralleled by Lewis’s descriptions of his own ‘mental-emotive impulse [...] let loose upon a lot of blocks and lines of various dimensions’.⁴⁴

Lewis later averred that ‘The Great London Vortex’ and the term ‘Vorticism’ had been catch-phrases ‘invented (not by me)’ which ‘described a movement sprung in the brain of one man (in the present instance, mine)’ (*WLA* 454). Given Lewis’s self-distancing from the ‘birth’ of Vorticism, though not from its ideas, the circumstances of its nativity as much as those of its ‘death’ need appraisal. The poet Ezra Pound had earlier coined the term ‘Imagisme’ to define a poetic mode (to which he then adhered) that achieved ‘the furthest possible remove from rhetoric’.⁴⁵ He first employed the term ‘Vortex’ in 1913, initially to describe the particular vitality of the (still unlabelled) paintings of Lewis and the sculptures of Henri Gaudier-Brzeska (1891-1915). With the hydrokinetic term ‘vortex’ he associated the use of the functional coordinates of Cartesian (or ‘analytical’) geometry (‘the difference between art and analytical geometry is the difference of subject-matter only’ [*GB* 91]) to provide a sobriquet more or less parallel to literary ‘Imagisme’: ‘that which presents an intellectual or emotional complex in an instant of time’ (*GB* 86). After Gaudier’s death in 1915, Pound observed that ‘his sculpture would have been just what it was, even if there had been

no “Vorticist movement” [...] or if the very terms “vortex” and “Vorticism” had not been given him “as a peg for his thought” (GB 25). Moreover: ‘At no time was it intended that either Mr. Lewis, or Gaudier, or myself, or Mr. Wadsworth or Mr. Etchells should crawl into each other’s skins or that we should in any way surrender our various identities’ (GB 25).⁴⁶

Nevertheless, ‘Vorticism’ has stayed with us, at least as a term of convenience, as also happened to Expressionism, Cubism, and Futurism. It stayed largely because a generalized, Cartesian-related stiffening of aesthetic values appealed to such contemporary critics as T. E. Hulme as a desirable ‘refuge from confusion and accidental detail of existence’.⁴⁷ As Pound expressly put it: ‘Vorticism is art before it has spread itself into flaccidity’ (GB 88), or, as he more ambitiously put it in 1934, ‘a complete revaluation of form as a means of expressing nearly everything else’ (GB 144). Lewis’s own dismissal of the ‘Great London Vortex’ as a ‘catch-phrase’ did not deter him from making positive use, in the same article, of ‘Vorticism’ as something of enduring value: ‘I can think of dozens of drawings which would not be the original things they are if it had not been for their “Vorticist” ancestry’ (WLA 455). Of Lewis’s own post-Vorticist work of the 1920s (and later), Charles Handley-Read observed that his line was ‘geometrical, architectural: architectural not only in the sense that it was clean and precise, intolerant of soft evasion, drawn as from a blueprint, but also architectural in the shapes it assumes and suggests’.⁴⁸

The Vortex Regained?

By the 1930s Lewis recognized that, rather than the painter and the engineer having ‘got together’ to diminish the role of the architect, as he had suggested in *The Caliph’s Design*, the engineer and the architect had meanwhile ‘got together’ to create modern buildings (or establish an architectural space) that diminished the role of the painter within the built edifice, thereby fulfilling – as Fernand Léger put it – ‘the desire of modern architects to absorb [art objects] by their reduction to no more than a means of action in an organized ensemble’.⁴⁹ In his reminiscent 1934 article, Lewis wrote:

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the pictures produced by myself, and other painters of similar aims, and which have been produced continuously since that time, were often rather exercises in architectural theory [...]. [W]e sometimes took the picture a little for granted. It became merely picture X – a propositional abstraction, as it were.

But what has happened, in the sequel? Well, the appropriate shells – the buildings – have been, in a small way it is true, forthcoming. But they, too, have forgotten the picture! Or, rather, it has turned out that the architect (having *got* his Vortex at last) has conceived it usually in such a manner as potentially to *exclude* the picture altogether from his dogmatic vorticist or cubist walls. (*WLA* 278)

Lewis named a dozen architects then working in Britain who implicitly had ‘got their Vortex at last’. They included the former Vorticist painter Frederick Etchells, who, turning to architecture, and having in 1927 published an English translation of Le Corbusier’s *Vers une Architecture*, co-designed an office block in London’s High Holborn (1929-30) described by Dennis Farr as a ‘distinguished example of the new urban architecture’.⁵⁰ Of the other architects named by Lewis, most had been too young, or had come from overseas, or both, to have associated with Vorticism, but Wells Coates (1895-1958) had ‘developed an interest [...] in the philosophy and writing of Wyndham Lewis’.⁵¹ Among a later generation of distinguished architects, the biographer of Richard (Lord) Rogers (b. 1933) notes that at the Epsom College of Art ‘the intellectual traditions in which he immersed himself were consistently non-British, apart from a passing fascination with Vorticism’.⁵²

The International Style

Those architects who for Lewis had ‘got their Vortex at last’ did so within the broad phenomenon that became known as ‘The International Style’, more or less a syncretism of De Stijl, Purism, Constructivism, and the teachings of the Bauhaus, without a specific attachment to any one of those precedents. It emerged as an aspect of the fundamental shift in the late 1920s in public perceptions of ‘modern design’. Between 1929 and 1932 half a dozen important books on modern architecture were published in London and New York, including a translation of Bruno

Taut's *Die neue Baukunst in Europa und Amerika* under the title *Modern Architecture* (1929). In 1932 the book entitled *The International Style*, by H. R. Hitchcock and Philip Johnson, made its appearance in conjunction with an exhibition at New York's Museum of Modern Art. It is questionable whether the book described an authentic 'style', or a general tendency towards 'space enclosed by thin planes or surfaces as opposed to the suggestion of mass and solidity; regularity as opposed to symmetry or other kinds of obvious balance; and, lastly, dependence on the intrinsic elegance of materials, technical perfection, and fine proportion, as opposed to applied ornament'.⁵³ At that date the 'International Style', however international its significance, belonged primarily to Western Europe. The Hitchcock/Johnson book illustrated fifty-six buildings from Western Europe, eight from the USA, and two from elsewhere. One British building received recognition: The Royal Corinthian Yacht Club at Burnham-on-Crouch (1929-31) by Joseph Emberton (one of Lewis's nominees). When the book was reprinted in 1966, Hitchcock provided a new foreword describing the history of architecture 'in our century' as a 'flowing stream [...] varied by many eddies and sub-currents before 1920, but then confined in the twenties to a narrow channel, so that for a while it rushed forward, on the physicist's principle of the venturi, at almost revolutionary speed'.⁵⁴ That the hydrokinetic vortex might have contributed to an eddy effectively confined (and given direction) by a venturi ('a tube with a constriction used to reduce or control fluid flow') provides, at any rate, a pleasant conceit.

The success of the International Style owed much to an allied, but distinct, art-form: architectural photography. The images of uncluttered, newly-built edifices, exhibiting the characteristics noted above, using chiaroscuro and foreshortening (and possibly some retouching) to heighten a sense of artistic perfection and drama, and also to provide an enduring illusion of a sculptured plasticity that gives 'a sort of death and silence in the middle of life' (*WLA* 218), the kind of immortality Lewis had in 'The Credentials of the Painter' (1922) identified with high art. That success belongs largely to the photographer's skill (though the buildings had first to be built, and the client had to be won over to the architect's vision).

The 1950s saw the last of Lewis's critical books, *The Demon of Progress in the Arts* (1954), a major exhibition of 'Wyndham Lewis and Vorticism' at the Tate Gallery in 1956, and the death of Lewis himself in

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1957. This was also the decade when a critical reaction against the International Style gained momentum, primarily because ambitious architects grew dissatisfied with what had become ‘normal architecture’ or, as Charles Jencks put it, its ‘undeniable banality’ at the hands of humdrum practitioners ‘became so obvious that the curtain wall and its related aesthetic fell into disrepute’.⁵⁵ Sociological factors also played a part, as Anton Ehrenzweig noted in 1967:

The earlier technological type of functionalism utilized the technological limitations imposed by new materials and techniques and arrived at new solutions. Modern building techniques soon proved so flexible that they could be made to conform with almost any preconceived structure. Today architects are casting around for sociological factors that would introduce welcome complication into their calculations [...] [and] see themselves as social reformers creating new needs for them to satisfy.⁵⁶

The wider issues of ‘functionalism’ themselves caused controversy. In one critical assessment ‘a typical Bauhaus building’ (i.e. one typifying the International Style) ‘provided only a generalised “logical space”, defining an ensemble of architectural possibilities’, so that ‘[f]ar from being functional, the resultant structures have been [...] the nearest things yet seen to the physical realization of a pure Cartesian system of geometrical co-ordinates’.⁵⁷ Such a ‘physical realization’ would apply no less to Pound’s earlier concept of a Cartesian-based Vorticist aesthetic.

Space and Western Man

Neither ‘function’ nor ‘space’, key terms in twentieth-century architectural discourse, are straightforward. The architect Daniel Libeskind, continuing the arguments into the twenty-first century, has described architectural space as an ‘adventure which has an obscure genesis and an open history’.⁵⁸ Among Lewis’s contemporaries, the aesthete Geoffrey Scott (1883-1929) observed that architecture ‘can surround us with a void of three dimensions’. It ‘uses space as a material and sets us in its midst’.⁵⁹ ‘Functionalism’ overlaps the concepts of ‘Utilitarianism’ and ‘Rationalism’, all finding convenient shelter within

the 'International Style'. The art historian Adolf Behne essayed a distinction between them in 1926: 'Functionalists are concerned with solving a problem of general significance to our culture. The utilitarian only asks: "What is the most practical way for me to act in the case?" But the functionalist asks: "How do I most correctly act in principle?"' A rationalist, 'led by a conscious emphasis on a human will to objectivity', seeks a claustral, 'typifying', or 'Ideal' answer to the philosophical question posed by the functionalist (that is, possibly, an image of rationality that may not be, in its application, rational).⁶⁰

Lewis's *Time and Western Man*, published in 1927, offered – according to the author – 'a comprehensive study of the "time"-notions' which at that point had, 'in one form or another, gained an undisputed ascendancy in the intellectual world' (*TWM* xviii) by 'ask[ing] us to see everything *sub specie temporis*' (*TWM* xix). '[E]ven in the arts of painting, sculpture, and design' this 'indisputed ascendancy' had 'exercised, usually indirectly, some influence' (*TWM* 22). Reviewing the book, the American critic Lewis Mumford pointed out that Lewis had failed to show effectively 'how our great spatialising activities, painting, sculpture, city-building, have been weakened or undermined' (see review at *TWM* 512) by the 'indisputed ascendancy' of 'time'-notions. Had Lewis been less preoccupied with combating 'time'-notions he might successfully have explored possibly a more rewarding subject – 'Space and Western Man', a matter to which the Dutch architect Aldo van Eyck contributed the thought that 'a building must not only provide real practical space but also offer the opportunity for possible alternative activities for those who come to use it. It must be formally and structurally adaptable'.⁶¹ In short, for 'Western Man' a building, no longer a simple shelter against the elements, and the space it occupies (albeit conceived *sub specie architecturae*) lives on after completion *sub specie temporis*.

The notably singular – even idiosyncratic – approach to both space and function of the Austrian architect Friedrich Kiesler (1896-1966) merits consideration here, not least against a 'Vorticist' background. Associated in the early 1920s with De Stijl, Kiesler produced a well-regarded stage setting for Karel Capek's 'robot' play *RUR* in Berlin in 1923 before organizing and contributing to the 1924 Vienna International Theatre exhibition. Here he 'designed his exhibition as an open cage of suspended colour flats, one partially enclosed space flowing into another. His colour flats were arranged to evoke an illusory space in real space [...]. As the spectator moved

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through the environment the advancing and retreating properties of colour combined with scale differences between suspended rectangles evoked a continually changing space of the imagination'.⁶² Among other contributors to the exhibition the Italian Futurist Prampolini provided a manifesto for the occasion in which he sought an 'electrodynamic multidimensional architecture of luminous plastic elements in movement at the centre of the theatrical concavity', a 'personification of space' which replaced the role of the actor, seen as 'a useless element in theatrical action', which had 'space as a scenic individual dominating theatrical action'.⁶³

In 1925, after he was appointed the Architect/Designer of the Austrian Section of the Paris *Arts Décoratifs* exhibition, Kiesler designed 'a suspended framework constructed on a tension system without foundations or walls, and without a static axis', called 'The City in Space'.⁶⁴ In the following year he moved to America where, as well as practising (largely in stage design) as an architect, he published several polemical writings which applied the psychological ideas behind the works of contemporary Surrealist artists to the purposes of architecture. As 'the only surrealist architect, whose formal legitimacy cannot be questioned'⁶⁵, Kiesler 'introduced a new dimension into architecture where events could not be separated from deep unconscious processes [...] the search for the deepest nature of architecture'.⁶⁶ Of those 'unconscious processes' and 'the deepest nature of architecture', Charles Jencks comments: 'A rational, conscious method of design tends to discourage all the unconscious and delightful and spontaneous parts of creation that give any work its life. Although there may not be any necessary reason why this should be so, it incontestably is'.⁶⁷

Kiesler's closest associate among the émigré Surrealists in America, the French-born Yves Tanguy, 'became obsessed with a vision of space as an infinite being'.⁶⁸ This vision, embodied in his painting *L'Armoire de Protée*, offered Alain Jouffroy 'the sudden opening of a door where everything is possible [...]. Up to that moment I had believed poetry alone capable of exploring what remains inaccessible to men. Yves Tanguy convinced me on the contrary of the exploratory function of painting'.⁶⁹ For Anna Balakian, 'Tanguy's groupings and enigmatic spaces between objects seem to have been guided to their position by divine chance. [...] Groupings seem to possess separate horizons suspended in a sphere freed of measured time. [...] Here we are as close to facing pure creation as has been given to any artist'.⁷⁰ Lewis, for his

part, in 1929 included Tanguy among the small group of artists who suggested ‘what our civilization *might* become if it wanted to. That civilization can always say to itself – “There is my model, in full working order: there is architecture, there is every form of design, indications of novel art-forms, only waiting to burst harshly into bloom”’ (WLA 257). So, should we look for the presence of the architect’s Vortex there, or in a Cartesian system of geometrical co-ordinates?

Notes

¹ Rudolf Wittkower, *Architectural Principles in the Age of Humanism* (London: Tiranti, 1973), 72.

² Shearer West (ed.), *The Bloomsbury Guide to Art History* (London: Bloomsbury, 1997), 384.

³ Lionel (Lord) Esher, former P.R.I.B.A. (President of the Royal Institute of British Architects), described Lethaby as ‘the heaven-sent antidote to [William] Morris. Brought up in the tough but humane atmosphere of Norman Shaw’s busy office, he was instinctively anti-elitist and was able to speak of a new architecture more attractively, and more in the language of a later generation, than any other Englishman’. See Lionel Esher, *A Broken Wave: The Rebuilding of England 1940-1980* (London: Allen Lane, 1981), 35.

⁴ Alastair Service, *Edwardian Architecture: A Handbook to Building Design in Britain 1890-1914* (London: Thames & Hudson, 1977), 13.

⁵ Shearer West, *The Visual Arts in Germany 1890-1937: Utopia and Despair* (New Brunswick, NJ: Rutgers University Press, 2001), 140.

⁶ Hans Schliepmann, cited in Harry Francis Mallgrave and Eleftherios Ikononou (eds), *Empathy, Form, and Space: Problems in German Aesthetics 1873-1893* (Santa Monica, CA: Getty Center for the History of Art and the Humanities, 1994), 282.

⁷ Amadée Ozenfant, *Foundations of Modern Art* (New York: Dover, 1952), 305.

⁸ Werner Haftmann, *Painting in the Twentieth Century* (1960), trans. Ralph Mannheim (New York: Praeger, 1965), 198.

⁹ Nikolaus Pevsner, *Pioneers of Modern Design: From William Morris to Walter Gropius*, fourth edn (New Haven, CT: Yale University Press, 2005), 115.

¹⁰ Jeffrey Herf, *Reactionary Modernism: Technology, Culture, and Politics in Weimar and the Third Reich* (Cambridge: Cambridge University Press, 1984), 158.

¹¹ *Ibid.*, 159.

¹² Harry Stuart Goodhart-Rendel, *English Architecture since the Regency: An Interpretation* (1953), ed. Alan Powers (London: Constable, 1989), 259.

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- ¹³ Kenneth Frampton, *Modern Architecture: A Critical History* (London: Thames & Hudson, 1985), 68.
- ¹⁴ Anne Massey, *Interior Design of the Twentieth Century* (London: Thames & Hudson, 2001), 36.
- ¹⁵ Debora L. Silverman, *Art Nouveau in Fin de Siècle France: Politics, Psychology, and Style* (Berkeley: University of California Press, 1992), 2-3.
- ¹⁶ Ibid., 5. Renato Barilli uses a near-Vorticist analogy of equilibrium in describing Horta's work: 'a kind of storm with a calm centre – in the very heart of a whirlpool of curvilinear patterns and concentric whirls'. See Renato Barilli, *Art Nouveau* (London: P. Hamlyn, 1969), 77.
- ¹⁷ Nikolaus Pevsner, *A History of Building Types* (London: Thames & Hudson, 1984), 292.
- ¹⁸ Frank Whitford, *Expressionism* (London: Hamlyn, 1970), 28.
- ¹⁹ West, *The Visual Arts in Germany*, 109.
- ²⁰ Ibid., 147.
- ²¹ Frank Whitford, *Bauhaus* (London: Thames & Hudson, 1984), 47-48.
- ²² Yve-Alain Bois, 'Cubistic, Cubic, and Cubist', in Eve Blau and Nancy J. Troy (eds), *Architecture and Cubism* (Cambridge: MIT Press, 1997): 187-94, 187.
- ²³ Michael Baxendall, *Patterns of Intention: On the Historical Explanation of Pictures* (New Haven, CT: Yale University Press, 1985), 55.
- ²⁴ Bois, 'Cubistic, Cubic, and Cubist', 189.
- ²⁵ Douglas Cooper, *The Cubist Epoch* (New York: Phaidon, 1971), 113.
- ²⁶ Beatriz Colomina, 'Where Are We?', in Blau and Troy (eds), *Architecture and Cubism*: 141-66, 148.
- ²⁷ Ibid., 149.
- ²⁸ Ozenfant, *Foundations of Modern Art*, 328.
- ²⁹ David Cottingham, 'The *Maison Cubiste* and the Meaning of Modernism in Pre-1914 France', in Blau and Troy (eds), *Architecture and Cubism*: 17-40, 18-20.
- ³⁰ Jonathan M. Woodham, *A Dictionary of Modern Design* (Oxford: Oxford University Press 2006), 102.
- ³¹ Rudolf Herman Fuchs, *Dutch Painting* (London: Thames & Hudson, 1978), 180.
- ³² Muriel Emanuel (ed.), *Contemporary Architects* (New York: St Martin's Press, 1980), 602.
- ³³ Richard Weston, *The House in the Twentieth Century* (London: Laurence King, 2002), 42.

- ³⁴ Filippo Tommaso Marinetti, 'The Founding and Manifesto of Futurism' (1909), in Umbro Apollonio (ed.), *Futurist Manifestos* (1970) (London: Tate Publishing, 2009): 19-24, 22.
- ³⁵ Cooper, *The Cubist Epoch*, 167.
- ³⁶ Caroline Tisdall and Angelo Bozzolla, *Futurism* (London: Thames & Hudson 1985), 125.
- ³⁷ Antonio Sant'Elia, 'Manifesto of Futurist Architecture' (1914), in Apollonio (ed.), *Futurist Manifestos*: 160-72, 171-72.
- ³⁸ Giovanni Lista, *Futurism* (1986), trans. Charles Lynn Clark (Paris: Terrail 2001), 93-94.
- ³⁹ Frampton, *Modern Architecture*, 203 and 206.
- ⁴⁰ Camilla Gray, *The Russian Experiment in Art 1863-1922* (London: Thames & Hudson, 1971), 268.
- ⁴¹ Frampton, *Modern Architecture*, 88.
- ⁴² Heinrich Wölfflin, *Principles of Art History: The Problem of the Development of Style in Later Art* (1915), trans. M. D. Hottinger (New York 1950), 149.
- ⁴³ Peter Gay, *Art and Act: On Causes in History – Manet, Gropius, Mondrian* (New York: Harper & Row, 1976), 209.
- ⁴⁴ Charles Handley-Read, *The Art of Wyndham Lewis* (London: Faber & Faber, 1951), 53.
- ⁴⁵ Ezra Pound, *Gaudier-Brzeska: A Memoir* (New York: New Directions, 1970), 83. Hereafter referred to as *GB* parenthetically in the text.
- ⁴⁶ Richard Humphreys notes that 'the concept of the Vortex was prevalent in Edwardian poetic and occult (particularly Theosophical) circles' and that Pound merely appropriated a fashionable term. See Richard Humphreys, 'Demon Pantechnicon Driver: Pound in the London Vortex 1908-1920', in Richard Humphreys (ed.), *Pound's Artists: Ezra Pound and the Visual Arts in London, Paris and Italy* (London: Tate Gallery, 1985): 33-80, 43-44.
- ⁴⁷ Michael Roberts, *T. E. Hulme* (Manchester: Carcanet New Press, 1982), 20.
- ⁴⁸ Handley-Read, *The Art of Wyndham Lewis*, 69.
- ⁴⁹ Fernand Léger, *Polychromatic Architecture* (1924), in John Golding and Christopher Green (eds), *Léger and Purist Paris* (London: Tate Gallery, 1970): 95-96.
- ⁵⁰ Dennis Farr, *English Art 1870-1940* (Oxford: Clarendon Press, 1978), 268.
- ⁵¹ Alan Powers, *Modern: The Modern Movement in Britain* (London: Merrell, 2005), 80.
- ⁵² Bryan Appleyard, *Richard Rogers: A Biography* (London: Faber & Faber, 1986), 68.

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- ⁵³ Henry-Russell Hitchcock, Jr and Philip Johnson, *The International Style: Architecture since 1922* (New York: W. W. Norton & Co., 1966), 13.
- ⁵⁴ *Ibid.*, xii.
- ⁵⁵ Charles Jencks, *Modern Movements in Architecture* (Harmondsworth: Penguin, 1973), 42.
- ⁵⁶ Anton Ehrenzweig, *The Hidden Order of Art: A Study in the Psychology of Artistic Imagination* (London: Paladin, 1967), 68-69.
- ⁵⁷ Allen Janik and Stephen Toulmin, *Wittgenstein's Vienna* (New York: Simon and Schuster, 1973), 253.
- ⁵⁸ François Penz, Gregory Radick, and Robert Howell (eds), *Space in Science, Art and Society* (Cambridge: Cambridge University Press, 2004), 46.
- ⁵⁹ Geoffrey Scott, *The Architecture of Humanism: A Study in the History of Taste* (1914) (London: Architectural Press, 1980), 226.
- ⁶⁰ Adolf Behne, *The Modern Functional Building* (1926), trans. Michael Robinson (Santa Monica: Getty Research Institute for the History of Arts and the Humanities, 1996), 122-23 and 135.
- ⁶¹ Emanuel (ed.), *Contemporary Architects*, 845.
- ⁶² Golding and Green (eds), *Léger and Purist Paris*, 76-77.
- ⁶³ Enrico Prampolini, *Futurist Scenic Atmosphere* (1924), in Michael Kirby and Victoria Nes Kirby (eds), *Futurist Performance* (New York: E. P. Dutton & Co., 1971): 225-231, 229ff.
- ⁶⁴ William S. Lieberman (ed.), *Art of the Twenties* (New York: Museum of Modern Art, 1979), 20.
- ⁶⁵ Dalibor Veseley, 'Surrealism, Myth and Modernity', *Architectural Design*, 48. 2-3 (1978): 87-95, 93.
- ⁶⁶ Bernard Tschumi, 'Architecture and its Double', *Architectural Design*, 48. 2-3 (1978): 111-116, 116.
- ⁶⁷ Jencks, *Modern Movements in Architecture*, 395.
- ⁶⁸ Haftmann, *Painting in the Twentieth Century*, 271.
- ⁶⁹ John Herbert Matthews, *The Imagery of Surrealism* (Syracuse, NY: Syracuse University Press, 1977), xvii.
- ⁷⁰ Anna Balakian, *Surrealism: The Road to the Absolute* (London: University of Chicago Press, 1972), 205-6.