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DIEGO RIVERA AND JUAN O'GORMAN: POST-REVOLUTIONARY ARCHITECTURAL ANATOMIES

*Frida Kahlo once wrote that her husband, the great muralist Diego Rivera, was 'fundamentally a constructor, an investigator and above all, an architect'. Delving into this unexplored aspect of his artistic production, this article reassesses Rivera's muralism in light of his contribution to post-revolutionary architectural discourses and his relationship with the architect Juan O'Gorman to demonstrate how concepts of building design influenced his approach to visual composition. In 1931, O'Gorman constructed a house-studio for Kahlo and Rivera which exemplified the functionalist style that rose to prominence in public architecture during that decade. Drawing attention to the anatomical analogies employed by O'Gorman to articulate his utilitarian architectural vision, the author examines how Rivera's contemporary architecturally themed mural *The Making of a Fresco* (1931) integrates functionalist principles to establish a parallel between the discipline of built spaces and the bodies inhabiting them. Although both O'Gorman and Rivera later rejected functionalism in favour of an organic style, they continued to rely on physiological metaphors to conceptualise the relationship between architectural form and function. By following their shifting theorisations of the organic in modern architecture, the author traces the development of their shared thinking and an evolution in post-revolutionary building design from functionalism to a post-Taylorist organicism.*

Keywords: Diego Rivera, Juan O'Gorman, functionalism, muralism, post-revolutionary Mexican architecture

Reflecting on the career of her husband, the great muralist Diego Rivera, Frida Kahlo asserted that he was 'fundamentally a constructor, an investigator and above all, an architect'. 'He is an architect', she explained, 'in his painting, his way of thinking and in his passionate desire to configure an anonymous, functional, and stable society' (Kahlo 2001, 312). Kahlo's remarks were echoed by the architect Juan O'Gorman, a close friend of Rivera's, who described him as 'an architect in his paintings and a painter in his architectural compositions' (O'Gorman 1986, 126). Kahlo's and O'Gorman's identification of the fundamentally architectonic basis of Rivera's art illuminates an aspect of his pictorial production that has curiously eluded critical attention to date. In an attempt to fill this gap in existing scholarship, this article reassesses Rivera's muralism in light of his post-revolutionary engagement with architecture, and particularly his relationship with

O’Gorman, to demonstrate how theories of building design were integral to his approach to visual composition.

Between 1931 and 1932, O’Gorman constructed a studio-house complex for Kahlo and Rivera in the San Ángel district of Mexico City which exemplified the functionalist style that rose to prominence in public architecture during that decade. As Susan Antebi notes, O’Gorman’s socially oriented functionalism, which emphasised cost-efficiency and the health-giving capacity of architecture, paradoxically dovetailed with the economic objectives of the post-revolutionary state by situating built spaces and human bodies within ‘a capitalist circuit of production and investment’ (Antebi 2012, 544). Focusing more specifically on the implicit parallel in O’Gorman’s writings between the utilitarian value of built spaces and the bodies inhabiting them, I examine how aspects of his architectural philosophy manifest themselves in Rivera’s contemporary mural *The Making of a Fresco Showing the Building of a City* (San Francisco Art Institute, 1931), which depicts the human effort involved in the construction of a proletarian industrial society. By revisiting this overlooked work in the context of Rivera’s architectural writings and O’Gorman’s San Ángel project, I demonstrate how it draws on functionalist principles to establish a correlation between architectural and corporeal discipline. In the late 1930s, O’Gorman and Rivera drifted away from functionalism and embraced the organic style of the American architect Frank Lloyd Wright. In the final section of the article I move on to examine this transition, exploring how Rivera’s and O’Gorman’s reliance on bodily analogies to reconceptualise the relationship between architectural form and function during the 1940s and 1950s reveals an interesting line of continuity between their functionalist and organicist phases.

Rivera’s engagement with architecture has been noted by a small number of scholars. The most significant intervention in this area is Rafael López Rangel’s *Diego Rivera y la arquitectura mexicana* (López Rangel 1986), which documents Rivera’s participation in post-revolutionary architectural debates from the 1920s to the 1950s. More recently, Kathryn E. O’Rourke has examined Rivera’s role as ‘a client and theorist of modern architecture’ in relation to O’Gorman’s studio-house project (O’Rourke 2016, 178–182), while Keith Eggner (1995) has explored the influence of his writings on Luis Barragán’s design for the residential development Los Jardines del Pedregal (1945–1950). Although these studies highlight Rivera’s contribution to post-revolutionary architectural discourses, none considers how his engagement with the discipline affected his pictorial production. Despite the sustained link between Rivera’s and O’Gorman’s artistic and architectural activities, their ongoing exchange of ideas regarding the role of architecture in the politics of post-revolutionary society has not been examined in detail. My account of their friendship will illustrate how they shaped one another’s creative visions, while also providing a new perspective from which to assess Rivera’s muralism. By examining how O’Gorman and Rivera navigate a theorisation of the organic in the architecture of the new Mexican state, the article traces the development of their shared thinking and a broader evolution in post-revolutionary building design from technical functionalism to a renewed, post-Taylorist organicism.

Juan O'Gorman: Functional spaces, functional bodies

In the aftermath of the destructive military phase of the Mexican revolution (1910–1917), the terms ‘revolution’ and ‘reconstruction’ became synonymous (Meyer 1991, 2014). During the administration of Álvaro Obregón (1920–1924) architecture was integral to the physical and symbolic reconstruction of Mexican society. While the devastation wreaked by the civil war in itself demanded an ambitious building programme, Valerie Fraser notes that there was also ‘an urgent need for a physical infrastructure to support the new regime and enable it to implement its health and education programmes and to house the increasingly urbanised workforce’ (Fraser 2000, 22). The building that most powerfully embodied the values of the post-revolutionary state was the headquarters of the Secretaría de Educación Pública (SEP) in Mexico City, which was constructed under the direction of the new minister for education, José Vasconcelos. In his inaugural speech at the Ministry in 1922, Vasconcelos hailed the finished edifice as a ‘symbolic building’, identifying its noble and solid proportions as concrete evidence of ‘the conscience of the mature revolution’ (Vasconcelos 1957, 797, 800).¹ More specifically, the minister linked the building to his theory of *mestizaje*, a process of racial miscegenation that he believed would give rise to a new ‘cosmic race’ in Latin America. Pointing to its formal composition, which combined Spanish colonial architecture with a decorative programme comprised of pre-Columbian inspired murals by Rivera and a series of allegorical statues symbolising the continent’s great races, Vasconcelos upheld the structure as the concrete embodiment of this concept of cultural and racial synthesis (Vasconcelos 1928, 40).

The racial-theoretical foundations of Vasconcelos’s analogy draw attention to the physiological dimensions of the post-revolutionary project of national reconstruction. During the 1920s, Vasconcelos’s theories of racial improvement were complemented by a programme of social engineering which, in Foucauldian terms, could be defined as the biopolitical agenda of the Mexican state. During the early post-revolution period, this disciplinary power manifested itself through a state-sponsored public health programme which evolved into a more coherent eugenics programme in the 1930s. By promoting racial miscegenation, maternal hygiene, physical education, and behavioural reform relating to alcoholism and prostitution, these initiatives sought to shape a disciplined and productive citizenry capable of propelling economic development (Urías Horcasitas 2007, 110–115).

As anxieties surrounding public health in Mexico City deepened due to overcrowding and poor sanitation, public architecture became increasingly interlinked with the state’s biopolitical initiatives in the 1930s. Looking to Europe and particularly the theories of Le Corbusier for inspiration, urban theorists sought to address these crises by exploring the capacity of built spaces to improve public health and social order. Le Corbusier’s manifesto *Towards a New Architecture* (1923) addressed ‘the necessity for order’ in post-war European society by positing a functionalist paradigm for the industrial age that conceptualised the house as ‘a machine for living’ (Le Corbusier 1927, 4). Le Corbusier’s dictum ‘Architecture or Revolution’ (Le Corbusier 1927, 8), which he used to express the capacity of buildings to maintain social order, paradoxically came to define post-revolutionary public architecture in Mexico from the 1930s into the 1960s, as the state

continued to legitimise itself through its rhetorical commitment to the social ideals of the revolution. The first significant interpreter of functionalism in Mexico was Juan O’Gorman, who read Le Corbusier’s manifesto in 1924 while studying under the architects Carlos Obregón Santacilia and José Villagrán García at the National School of Architecture. Influenced by Le Corbusier’s theoretical writings and these socially minded mentors, O’Gorman devised an architectural model based on the principles of cost-efficiency, hygiene, and spatial efficiency as a solution to the urban crisis. Dismissing the excessive ornamentation of Vasconcelos’s neo-colonial style as socially irresponsible, O’Gorman asserted that functionalism, which satisfied the material needs of the population and the economic necessities of national reconstruction, was the only viable architectural model for post-revolutionary society.

O’Gorman’s conception of a proletarian architecture modelled on the revolution’s social ideals echoed the Marxist rhetoric of the principal Mexican muralists, Diego Rivera, David Alfaro Siqueiros, and José Clemente Orozco, who rejected ‘bourgeois’ easel painting in favour of a collectivist and socially oriented form of public art. With the support of government funding, the muralists dominated the cultural landscape during the immediate post-revolution period, projecting their epic visual narratives of the nation’s experiences on the walls of public buildings. A childhood friend of Kahlo’s, O’Gorman became personally acquainted with Rivera while he was painting his first state-commissioned mural *Creación* (1922) in the Escuela Nacional Preparatoria, and a lifelong friendship developed between the two.² O’Gorman’s claim that Rivera was the greatest creative influence on his work (O’Gorman 1973b, 103) is most strikingly evidenced by his architectural application of the Russian avant-garde ideologies to which the muralist subscribed during the late 1920s. Rivera visited the USSR in 1927 with the delegation of the Partido Comunista de México to celebrate the tenth anniversary of the Russian Revolution, and the following year he signed the manifesto of the October Association of Artistic Labour. Formed by a number of constructivist practitioners, including Alexander Rodchenko and the architects El Lissitzky and Moisei Ginzburg, this artistic collective advocated a socially committed approach to art and considered artistic activity analogous to industrial production. The constructivists’ utilitarian fantasy of ‘a faster, more receptive human mind and body’ (Harte 2010, 155) was partially shaped by Taylorist theories of scientific management. Taylorism looked to maximise human efficiency along the assembly line by assigning specific tasks to individual workers and streamlining their bodily movements to eliminate all superfluous gestures. Lissitzky and Ginzburg, whose ‘functional’ method overlapped considerably with Le Corbusier’s, encouraged architects to act as Taylorist ‘method engineers’ by extending the organisational systems of the factory to other buildings, such as worker housing complexes (Cohen 1995, 131). Using flow diagrams to analyse and minimise the movements of inhabitants, Ginzburg envisioned these structures as ‘social condensers’ that would promote rationalised and standardised forms of collective behaviour (Kopp 1986, 38).

O’Gorman’s application of these theories is best illustrated by the primary schools he constructed for the SEP during the early 1930s, when the values of hard work, collectivism, and productivity had become central tenets of the state’s

socialist education campaign. In 1931 Rivera introduced O'Gorman to Narciso Bassols, Vasconcelos's successor at the SEP (1931–1934), who appointed him as head of the Department of Construction. O'Gorman's emphasis on hygiene was particularly appealing to Bassols, who stressed the rationalising potential of socialist education. Although O'Gorman abandoned his medical studies to pursue architecture, he devoted his early career to converting Mexico's built spaces into tools for physiological reform that would promote 'hygiene of body and mind' (O'Gorman 1982a, 74). Like his earlier designs for high-rise worker housing complexes such as the *Proyecto de habitaciones colectivas para obreros* (1928), O'Gorman drew inspiration from Le Corbusier's grid-based compositions to ensure the functional and efficient organisation of architectural space. The grid imposed a strict spatial order on the buildings, allocating precisely one square metre per child inside the buildings and five square metres in the playgrounds (Fraser 2000, 48). O'Gorman was equally economical in his management of resources, constructing the buildings from reinforced concrete and other mass-produced industrial materials. Although the architect fervently endorsed the modernist doctrine that function should dictate form, his description of the schools' stripped-down appearance betrayed his adherence to a constructivist aesthetic that celebrated the very process of industrial construction: 'if these buildings have no decoration or adornment it is simply because it was not the intention to conceal its construction ... but rather the contrary, it reveals it proudly and with total honesty' (O'Gorman 1933, n.p.). O'Gorman proudly acknowledged the resemblance of the buildings to manufacturing plants and upheld this as evidence of their total efficiency: 'If the buildings look like factories it is simply because factories are built to function efficiently. They are built without aesthetic concerns or false pretensions of art, only under the rational principle of obtaining the maximum efficiency for the minimum effort and cost' (O'Gorman 1933, n.p.).

Like Ginzburg's designs, the factory-like appearance of O'Gorman's structures was indicative not only of an insistently frugal approach to building materials, but also of a conscious attempt to extend the organisational frameworks of industrial production, and its associated behavioural principles of discipline and productivity, to other architectural spaces. As Antebi (2012, 540) notes, O'Gorman's technical model upheld the biopolitical aims of the state's developmentalist campaign by promoting the Lamarckian notion that hygienic architecture could create a more robust future population. However, the intersection between O'Gorman's architecture and the state's capitalist agenda is perhaps even more strikingly revealed in his metaphorical projection of functionalism's utilitarian ideals on to human bodies. In a key speech in 1933, O'Gorman insisted that 'men are rational animals and to follow any system that does not guarantee maximum efficiency for minimum effort is not acting rationally' (O'Gorman 1982a, 73). This direct linking of rational building construction with rational human behaviour emerges as a recurring metaphor in O'Gorman's early writings on the relationship between architectural form and function. O'Gorman compares the desire for decorative details that satisfy human 'emotions and spiritual needs' to that of an alcoholic who intoxicates himself with substances that damage 'the organic cells of man' (O'Gorman 1982a, 70). When architecture pursues aesthetic pleasure through superfluous

ornamentation, ‘art then becomes a parasite that lives off the technical and sucks the sap that should have strengthened and increased human productive capacity’ (O’Gorman 1982a, 76). Here the prioritisation of function over aesthetic form is explained using distinct anatomical analogies; the irrational management of resources is likened to the useless inebriate, while an efficient approach to construction corresponds to bodily productivity. As I shall go on to illustrate, the underlying contention in these metaphors—that the utilitarian composition of buildings could shape rational and productive human subjects—highlights a point of intersection between O’Gorman’s San Ángel project and Rivera’s contemporary mural.

The San Ángel studio-house (1931–1932)

In the late 1920s O’Gorman began applying functionalist principles to the construction of individual houses. The first of these experiments was a house for his father Cecil O’Gorman in the San Ángel area in 1929, which he hailed as ‘the first functional house in Mexico’ (O’Gorman 1973b, 100). O’Gorman invited Rivera to view the house and was surprised by his appreciation of its aesthetic value, given that it had been constructed according to completely utilitarian principles. In his autobiography O’Gorman recalled how:

In that moment Diego Rivera invented the theory that architecture carried out according to the strict method of the most scientific rationalism, is also a work of art. And given that with this idea of maximum efficiency and minimum cost, a greater number of houses could be built with the same effort, it was enormously important for the quick reconstruction of our country, and therefore (according to *Maestro* Rivera) this made the building beautiful. (O’Gorman 1973b, 102)

Rivera’s reaction was not, however, spontaneous. It reflected the profound admiration for rationalist architecture that he had developed over the previous decade. Rivera actively contributed to architectural debate throughout the post-revolution period and his engagement with the constructivists probably fostered his interest in the role of architecture in achieving the aims of social revolution. Writing in 1930, the muralist asked:

In the social domain, what are the accomplishments of the organised college of professional architects? With the millions they have earned, what have they done about the dwellings of the factory workers, the miners and the tenant workers at the landed estates? What have they done to humanise the rooms inhabited by the poor? (Rivera 1979a, 101)

Rivera had already started identifying architectural solutions to these problems in his review of a proto-rationalist apartment unit designed by Villagrán, Obregón Santacilia, and O’Gorman, which was published in the magazine *Mexican Folkways* in 1926. Denouncing the ostentatious and costly constructions of the Porfiriato, Rivera praises the ‘double aesthetic and social aspect’ (Rivera 1926, 19) of the building’s design:

It is a neighborhood house of cheap apartments, hygienic and beautiful. In this work, Carlos Obregón followed the tendency of truth in his profession with undeniably happy results. He avoided all 'camouflage', all waste of material, employing as factors of beauty, the economy of materials and their maximum utility. In one of the most available corners of the house come into play with new and harmonious contrast, the fastenings of the pipes and static cylinders of the tubes, with the pure and simple cubes and parallelograms of the rooms. (Rivera 1926, 22)

The same year, Rivera's draft design for the construction of a theatre in Vera Cruz was published in the magazine *Forma*. Although this project was never carried out, a review of Rivera's proposal by the painter Agustín Lazo highlights the distinctly functionalist aspects of its design, such as the 'nakedness of its reinforced cement' and its minimalist composition ('it is free of ornamentation, it requires no decoration') (Lazo 1986, 87).

Given Rivera's belief in the socially transformative potential of rationalist architecture, it is likely that his commissioning of the San Ángel complex was partially an attempt to raise the profile of functionalism in Mexico. The project marked a pivotal moment in O'Gorman's career, paving the way for his state collaborations and a series of other commissions from prominent political and cultural figures



Figure 1 Juan O' Gorman, The Kahlo-Rivera House, San Ángel, Mexico City (1931–1932). © ARS, NY and DACS, London 2019. © 2019. Digital image, The Museum of Modern Art, New York/Scala, Florence.

such as Frances Toor and Julio Castellanos. O’Gorman began work on the studio-house in 1931 and completed it the following summer (Figure 1). The finished complex, which is widely regarded as ‘a triumph of functionalist principles’ (Buffington 2004, 24) was closely modelled on the Paris studio designed by Le Corbusier for the artist Amédée Ozenfant in 1923. Mirroring the structure of this earlier building, which was set like ‘a transparent cube’ (Gans 1987, 38), O’Gorman designed two conjoined cubic buildings with expansive steel windows and incorporated supportive *pilotis*, an exterior spiral staircase, and a sawtooth roofline almost identical to those used in Le Corbusier’s atelier.³ O’Gorman offset these austere modernist forms with vernacular details such as the wall of cacti lining its perimeter and the use of vibrant colours for the exterior walls. The two independent buildings, painted red and blue to indicate their function as separate living and work spaces for Rivera and Kahlo, respectively, were connected only by an outdoor bridge on the second floor. Fraser’s (2000, 44) interpretation of the precarious walkway as a visual metaphor for their ‘semi-detached’ marital arrangement is supported by the obvious structural resemblance of both buildings to their respective inhabitants. Architect Toyo Ito’s observation that the dominant red building and its leaner blue counterpart resemble the rotund Rivera resting his hand on the shoulder of the svelte Frida (Ito 2015, 88) again points to the persistent link in O’Gorman’s functionalism between the architectural form of his buildings and the bodies, real or imagined, of their inhabitants.

O’Gorman’s subtle corporeal analogy can be traced back to Le Corbusier’s conception of the house as ‘an organism comparable to a living being’ (Le Corbusier 1927, 180). Le Corbusier conceptualised the body as an almost mechanical composite of functional components serving specific needs and argued that the application of biological organisational systems to architecture (such as the equation of ventilation with respiration and electricity with the nervous system) would maximise its ability to improve human well-being. Burian highlights similar examples of architectural anthropomorphism in O’Gorman’s studio-house, such as the uncovered electrical cables, pipes, and fittings which are ‘reminiscent of veins and arteries’ (Burian 1997, 137). In keeping with Le Corbusier’s theories, the exposure of these compositional elements highlights the biopolitical purposes of the building’s design. While the exposed pipes indicate the hygienic disposal of waste, Burian describes how appliances such as the shower are ‘proudly presented as aids to health and cleansing’ (137). As Antebi (2012, 543) notes, O’Gorman’s concept of hygiene related not only to cleanliness but also to architectural space, manifesting itself as a concern with ‘the systematization of a grouping of elements, each one efficient in itself, and together producing a harmonious efficiency’. O’Gorman asserted that building composition should ‘unite and separate the useful places for work and those for rest, separated by walls, so that (each) should be efficient’ (cited in Fraser 2000, 52). This functional distribution of space is revealing in Rivera’s building, where the studio occupies a significantly larger area than any of the other rooms in the complex. The implication that O’Gorman conceived the building primarily as a place of human production is reflected in its industrial external appearance: bare concrete walls and exposed tubular ventilators and water tanks positioned on the roof.⁴

O'Gorman's configuration of the building as a kind of factory of artistic production reflects not only the underlying parallel between architectural and bodily utility that informed his functionalism, but also the equation of artistic and industrial labour promoted by the constructivists. Like O'Gorman, Rivera believed that painting, sculpture, and architecture were fundamentally interlinked.⁵ During his brief time as director of the Escuela Central de Artes Plásticas in 1929 he integrated architectural and engineering lessons to transform the school into 'a great workshop' where artists could develop into 'real technical workers' (Rivera 1986a, 88). Repeatedly photographed in overalls and perched on scaffolds as he painted his stone canvases, the muralist embraced the constructivist notion of the artist-as-labourer by cultivating a workman-like public image during this period. Rivera frequently incorporated himself into his own murals; one of the most interesting examples of this is the often overlooked panel *El pintor, el escultor y el arquitecto*, included in his fresco cycle at the SEP (1923–1928), where the muralist is portrayed with a floor plan, rather than a paintbrush, in hand. The obvious suggestion here that Rivera viewed himself as a visual architect was in line with the collective aesthetic agenda of the muralist movement. Alongside Siqueiros and Orozco, Rivera promoted 'plastic integration', a concept advocating the fusion of diverse art forms such as painting, sculpture, and architecture within a single work of art. Writing in 1921, Siqueiros extended this interdisciplinary link by suggesting that the visual content of the murals themselves should also be fundamentally architectural in form:

What is fundamental, what is the basis of the work of art is the magnificent geometrical structure of the *form* together with the conception, interlinking, and architectural materialization of the volumes and the perspective of the volumes which in their function as 'termini' generate the depth of space. *Create volumes in space.* (Siqueiros 1921, 3; italics in original)

Rivera's application of this idea is most immediately apparent in the architectonic configuration of the human body in his early murals. Notably, the same geometric terminology used by the artist in his review of the San Miguel house resurfaces in his discussion of the pictorial composition of human forms. Recalling the 'cylinders of the tubes' and 'the pure and simple cubes and parallelograms' used to compose the functionalist apartment building (Rivera 1926, 22), Rivera asserts that, in painting, 'every living form can be composed from the cylinder, the cone, the sphere or a combination of these elements' (cited in de la Torre 1959, 23). Rivera began developing this constructive approach to painting towards the end of his Parisian cubist period (1914–1917) when he moved towards a 'synthetic' phase of cubism that promoted the integration, rather than disintegration, of pictorial forms. His application of this method reveals itself in panels such as *La quema de los Judas* (1923) located on the ground floor of the SEP, where the bodies of the peasants are presented as a composite of simplified geometric forms which recall the industrially inspired 'tubist' anatomies of Fernand Léger.

The functionalist framework of *The Making of a Fresco* (1931)

The geometric composition of these bodies foreshadowed Rivera's shift towards a more industrial aesthetic in the early 1930s. After arriving in the United States in



Figure 2 Diego Rivera, *The Making of a Fresco Showing the Building of a City* (1931).
 © Banco de México Diego Rivera Frida Kahlo Museums Trust, Mexico, D.F. / DACS 2019.

1929, Rivera departed from the more historically themed content of his domestic murals to embrace the concrete and steel cityscapes of Detroit, New York, and San Francisco. This new industrial vocabulary is showcased in *The Making* where skyscrapers and aeroplanes dominate the urban skyline (Figure 2). As the mural's title suggests, however, Rivera is here more interested in the process rather than the final product of industrial construction, and the industrious figures populating

its interior indicate that his primary thematic focus is the human productivity propelling this societal progress.

The Making is founded on a series of intentional visual analogies. The mural's full title establishes a central comparison between the creation of a fresco and the construction of a city, which is allegorised by the giant industrial worker dressed in denim overalls standing in the centre of the composition.⁶ In front of this enormous figure, a large scaffold imposes a rigid structure across the visual field, dividing it into eight individual cells. The compartments to the centre and left of the lower section of the mural depict the conceptual stages of the city's design as donors and architects pore over sketches and blueprints, while the bottom left and upper cells depict these plans being realised by groups of artists and manual workers.⁷ Two teams of sculptors are positioned in the lower and middle cells on the left-hand side, while Rivera and his assistants occupy the central section of the mural where they paint the mural of the giant worker. Rivera summarised the mural's composition as follows:

The wall is subdivided into cells by the scaffold, which is the necessary pre-construction for all buildings. The scaffold is not only visible, it constitutes the very frame of the work and indicates the structural simplicity and plastic honesty of the composition. The various cells which it establishes contain all the elements of architectural construction; in the centre and base, are the machine, the engineer, the architect, and the donor; on either side, the raw materials, and the trained workers who construct and operate the machines and those who calculate and trace the plans of construction; above these draftsman are the metal workers who are raising the steel skeleton of the building, and opposite them, above the mechanics and iron forgers, the sculptors are giving living form to the stone with chisels driven by the power of air compressed by the machine; above the sculptors, the ventilators, those beautiful functional sculptures created by industrial necessity, renew the air of the factory: in the centre, on the planks of the scaffold are the painters and masons working on a fresco which shows the gigantic figure of a worker grasping the power control of the machine with his right hand and with his left the lever which regulates its speed. His head completes the composition at its highest point, and his gaze is fixed firmly forward ... (Rivera 1986c, 214)

While some of Rivera's later works such as the portable pieces for the Museum of Modern Art exhibition (1931–1932) denounce capitalist corruption, this description conveys the unmistakably optimistic tone of *The Making*, which elides the economic realities of the Depression era and celebrates technology as the basis of a utopian proletarian society. The most notable aspect of Rivera's commentary, however, is its use of functionalist terminology. The muralist highlights the visibility of the scaffold which functionally divides the composition into 'cells' or zones of activity. Recalling O'Gorman's description of the 'total honesty' of his buildings, which proudly displayed rather than concealed evidence of their own construction, Rivera explains how the exposed scaffold attests to the 'structural simplicity and plastic honesty' of the finished work. Again equating aesthetic value with utility, as he did in his earlier assessment of the proto-functionalist house in San Miguel, Rivera describes the ventilators in the upper left hand section as 'beautiful functional sculptures created by industrial necessity' (Rivera 1986c, 214).

Rivera's use of functionalist language is significant in light of the unique composition of this particular mural, which stands out in his *oeuvre* due to its distinctly

house-like appearance. Unlike many of his Mexican murals which wrap around the interiors of entire buildings, *The Making* occupies a relatively confined physical space. Although the president of the San Francisco Art Commission, William Gerstle, originally offered Rivera a smaller section of wall, measuring just 120 feet, the artist opted instead for the larger but unusually shaped interior north wall of the Institute's exhibition hall. While commentators have tended to focus on the elements contained within the visual field of the mural, a more integrated view incorporating the entire north wall and its distinctive architectural features provides a better understanding of the visual effects Rivera was trying to achieve. The argument for such an approach is all the more convincing when we consider Rivera's interest in fusing painting and architecture through 'plastic integration'. The slanting ceiling of the gallery causes the upper part of the mural to taper in like a roof, creating a doll's-house effect which is enhanced by the scaffold's vertical and horizontal division of the composition into separate compartments or 'rooms', and by the presence of a real door positioned below. Although the mural's title refers to the process of building a city, Rivera's subsequent claim that his intention had been to depict a 'dynamic concerto of construction – technicians, planners, and artists working together to create a modern building' (Rivera 1986c, 213)–indicates that this aspect of the fresco's appearance was intentional.

Rivera's configuration of the mural as a distinctly house-like functionalist building encourages a comparative reading with O'Gorman's contemporaneous architectural project in Mexico, which brings to light a number of compositional and theoretical parallels. The scaffold that rigidly compartmentalises the mural space into self-contained cells recalls the interior spaces of O'Gorman's cubic buildings which, as Burian (1997, 138) notes, 'were expressed as distinct, separate elements'. Recalling the intentionally exposed internal structural elements of the studio-house, the dominance of the wooden scaffold in *The Making* reflects Rivera's embrace of an industrial functionalist aesthetic that ostentatiously celebrated its own constructedness. The painted vertical wooden beams of the scaffold extend below the painted space to the floor of the gallery, creating the illusion of *pilotis*, while a set of steps to the right recall the external stairs leading to Kahlo's elevated quarters. These structural parallels are compounded by a chromatic correlation between the 'rich saturated blue', 'dark red', and 'yellowish stained wood' of O'Gorman's cubic buildings (Fraser 2000, 45) and the predominance of these primary colours in Rivera's mural.

Rivera's spatial arrangement of human bodies reveals his most striking pictorial interpretation of functionalism. Composed of multiple episodes and teeming with human activity, *The Making* reflects the *horror vacui* that defined Rivera's post-revolutionary works. Mirroring the spatial utilitarianism of O'Gorman's buildings, the muralist meticulously structured his works to ensure that every inch was charged with narrative significance. These compositions were also governed by a rigid spatial architecture which, as Anna Indych-López highlights, was achieved through his incorporation of the conceptual grid system used in cubist painting (Indych-López 2009, 137–155). Composed of intersecting vertical and horizontal lines, this concealed infrastructural device facilitated the harmonious distribution and integration of objects within the pictorial field. While Indych-López provides a compelling

commentary of how the conceptual grid functions as an organising principle in these works, she fails to address its impact on the bodies contained within it. The panel *Los tejedores* (1923–1924), located on the north wall on the first floor of the SEP, illustrates how Rivera used the cubist scaffolding system to spatially control figures within the visual field. In this portrait of three weavers working at a loom, the grid manifests itself in the intersecting lines of the threads and the wooden frames, to which they are connected. This network of converging lines fixes the figures in space, rooting them, respectively, within the foreground, middle-ground, and background of the composition. Rivera employed the cubist grid as a device for restraining the figures depicted in the majority of his murals. However, it manifests itself most clearly in his utopian projection of an industrial proletarian society at the San Francisco Art Institute. While the conceptual grid is subtly interwoven into the fabric of *Los tejedores*, this device is intentionally revealed in *The Making*, where it is metaphorised by the large *tromp-l'oeil* wooden scaffold that divides the visual field into self-contained zones of activity.

While *The Making* (alternatively entitled *Workers in Control of Production*) ostensibly projects the empowerment of the worker within a modern industrial society, the grid scheme highlights the disciplinary spatial technologies operating within the mural. By making the grid an integral part of his utopian societal vision, Rivera establishes a parallel between architectural and collective social order that visually articulates Le Corbusier's belief that 'where order reigns, wellbeing reigns' (Le Corbusier 1927, 54). More specifically, his use of the grid in this particular mural can be aligned with the biopolitical dimensions of O'Gorman's functionalism in its equation of spatial and bodily discipline. In keeping with the state's social engineering efforts to shape a disciplined and productive population, O'Gorman's application of the cellular grid format in his designs for schools and domestic buildings reflected a constructivist interest in extending the organisational systems of the factory to non-industrial architectural spaces. In his 1976 lecture, Foucault employs the orthogonal grid design as a pertinent architectural metaphor for disciplinary networks. Discussing working-class housing estates during the nineteenth century, Foucault notes how its structure articulates 'in a sort of perpendicular way, the disciplinary mechanisms that controlled the body' by facilitating 'spontaneous policing or control' (Foucault 2003, 251). Hubert L. Dreyfus and Paul Rabinow elaborate on Foucault's identification of the grid as the definitive architectural metaphor for disciplinary technology:

In disciplinary technology the internal organization of space depends on the principle of elementary partitioning into regular units. This space is based on a principle of presences and absences. In such a simple coding, each slot in the grid is assigned a value. These slots facilitate the application of techniques of discipline to the body. Once the grid is established, the principle reads, 'Each individual has a place and each place has its individual'. (Dreyfus and Rabinow 1983, 155)

In *The Making*, the architectural frame of the scaffold fulfils this disciplinary function by grouping bodies in particular sections of the grid according to their role within the construction process. Extending O'Gorman's spatial 'technique of distribution' to human bodies, Rivera's wooden frame functionally distributes the

figures to maximise their efficiency while also uniting them within a single system of production. This systematic organisation of labour correlates with Ginzburg's Taylor-inspired architectural theories, which held that 'the job of the architect should be decomposed into its constituent tasks to remove individual discretion and intuition' (Guillén 2006, 27). Following the Taylorist separation of 'task conception' from 'task execution', Rivera groups the planners, architects, and donors in the lower half of the mural while confining the manual tasks to the upper sections. This Taylorist management of labour, along with Rivera's fleeting reference to the ventilators which 'renew the air of the factory', suggests that he conceived of the building not only as a domestic house but also as a form of industrial plant. Rivera's conflation of these two ideas, both in his written description and visual composition of the mural, recall the Le Corbusien model of the 'House-Machine' (Le Corbusier 1927, 7) – a concept that is literalised by the image of the giant worker operating a lever to 'control the machine'.

The correlation between architectural and bodily discipline that emerges from this reading of the building as a factory-like house is illuminated by comments made by the artist in 1934. Reiterating O'Gorman's earlier arguments, Rivera explains in distinctly physiological terms how technical architecture will facilitate man's adaptation to the scientific rationalism of the machine age:

Tomorrow, architecture, the mother of all plastic arts, will be rationalised, it will slough off the leprous scales of its traditional ornamentation and expel from its walls the useless trumperies ... and replace them with a rationalised dwelling whose bright walls are splendidly illuminated by great spaces of glass and light – a dwelling suitable to the cerebral functioning of a civilised man who has conquered himself by means of the machines he has built and has cast off the diseases of mystic ideologies. (Rivera 1986c, 209)

The artist's belief that the rationalisation of architecture would produce rational new subjects is further reflected in the relationship between architectural and anatomical structures within the mural, which, as in O'Gorman's studio-house, is conceptualised in highly fluid terms. The central visual metaphor of the mural equates the creation of a fresco depicting the body of a worker with the construction of a modern building. This comparison is reinforced by the subtle parallel between the composition lines being sketched on the wall beside the worker's head and the steel cables being used to erect the skyscraper in the upper right-hand compartment of the mural. As in his earlier murals, Rivera employs geometric industrial forms as the compositional basis for these bodies. The overalls of the workers in the bottom left cell are composed of inverted triangles and rectangular pockets displaying small bolt-like fastenings, while the upright stance and slanting shoulders of the architect Geraldine Colby Frikie, depicted in the bottom right-hand cell, recall the T-square hanging on the wall behind her. This intermingling of human and industrial shapes is again evident in the distinctly anthropomorphic ventilators, which are composed of a trunk-like cylinder and tubular limbs, and the block of stone being chiselled by the sculptors below which resembles the side profile of a human face. These subtle comparisons are upheld by the physiological language employed in Rivera's commentary. His description of the sculptors giving 'living form' to the stone, while the metal workers raise the 'steel skeleton' of the building, reflects the central logic of

O'Gorman's functionalism, in which the properties of architectural structures and the bodies inhabiting them become interchangeable.

While Rivera's architectonic approach to visual form manifests itself in various aspects of his work, particularly in his corporeal imagery, the compositional and theoretical links between *The Making* and O'Gorman's studio-house reveal his reliance on specifically functionalist construction theories. Visually articulating his claim that rationalist architecture would facilitate man's adaptation to the machine age, the grid structure of Rivera's mural extends the functionalist ideals of architectural utility and discipline to the human body by enclosing its subjects within an efficient system of collective production. An analysis of the functionalist concepts underpinning this particular mural reveals exactly how Rivera perceived his artistic role, to recall Kahlo, as the visual architect of a 'functional and stable society'. While the mural is ostensibly Marxist in both its projection of a progressive worker-controlled society and its interpretation of the artist as a cultural labourer, Rivera's configuration of this proletarian utopia as spatially regimented industrial factory-space reflects the ideological contradictions that pulsed through O'Gorman's functionalism, and the post-revolutionary nation-building project more broadly.

Alternative architectural anatomies: The argument for aesthetic nourishment

O'Gorman's utopian functionalist vision waned in the late 1930s, as he began to reflect on the troubling implications of functionalism's conflation of the human and the mechanical:

For its mechanical and technical character, it ignored the need for aesthetic pleasure, which is one of the most important functions of true architecture. Functionalism reduced man to his mechanical needs in terms of shelter and as a result denied the satisfaction of a vital need of enormous importance: the joy and pleasure produced by the colour and form of the place in which one lives. In short, functionalism in architecture is mechanically rational and humanly illogical, because man is not a machine. (O'Gorman 1982c, 96)

Disillusioned with the failure of functionalism to improve living conditions for the working classes, O'Gorman abandoned architecture in 1938 and dedicated himself to easel painting and mural production. His sudden break from functionalism, which by the late 1930s had been established as the official architectural mode of the post-revolutionary state, was primarily motivated by economic and political developments in Mexico. As president Lázaro Cárdenas (1934–1940) pursued an aggressively developmentalist agenda, applications of functionalism in public architecture reflected the shifting priorities of a government that increasingly measured revolutionary progress in economic rather than social terms. Industrialisation accelerated rapidly during the administration of Miguel Alemán (1946–1952), leading to an era of unprecedented growth known as the 'Mexican miracle'. Despite dramatic economic development, with gross domestic product tripling between 1940 and 1960, and dramatic infrastructural and technological

development, widening class divisions and an increasingly authoritarian government attitude towards workers' unions indicated that the events of 1910–1917 had failed to bring significant social change to the nation (Bizberg 2003, 148).

O'Gorman highlighted the direct impact of these changes on urban planning and architecture, arguing that the maxim of 'maximum efficiency for minimum cost' had been distorted by the ruling classes to maximise profit and control the working class population (O'Gorman 1973a, 279). Rather than serve the interests of social revolution, modernist architecture, he felt, had been transformed into a tool of exploitation and ideological manipulation. During the 1940s and early 1950s Rivera also published harsh reassessments of Le Corbusier's projects in the magazine *Espacios*.⁸ Like O'Gorman, his turn away from the rationalist formula stemmed from bitter disappointment with the disintegration of the revolution's social ideals. Discussing the dominance of functionalism in an article published in 1952, Rivera asserted that 'the new bourgeoisie has started to reap its harvest' thanks to the blood spilled by the nation's revolutionaries (Rivera 1986b, 118–119).

O'Gorman's and Rivera's joint rejection of the clean industrial aesthetic of functionalism finds expression in their plastic imagery of this period. Mirroring the biomorphic forms of Rivera's contemporary surrealist paintings, O'Gorman's *Monumento fúnebre del capitalismo industrial* (1943) portrays industrial architectural structures melting away into roots and other organic material. A parallel shift can be discerned in O'Gorman's designs following his return to architecture in the 1940s, which drew from the organic theories of the US architect Frank Lloyd Wright to promote the harmonious adaptation of built structures to the cultural and geographical specificities of their location. Although his formal experiments at the beginning of the twentieth century laid the foundations for the International Style that was to become largely defined by Le Corbusier, Wright criticised the rigidity and sterility of rationalist design, arguing that 'the box was merely an inhibition and a restraint' that acted as an 'imposition' upon life (Wright 1953, 27). By adopting an alternative approach to form and space he created what he described as 'the free architecture of ideal democracy' (Wright 1955a, 320). Wright's distinctly fluid organic style, which was characterised by spatial continuity and flowing asymmetrical forms, championed individual imagination and freedom over the restrictive and uniform composition of functionalist design. Refuting the notion that architecture should limit itself to satisfying basic human needs, Wright drew inspiration from the natural world to formulate a therapeutic and spiritually elevating aesthetic. Although Wright was a vocal critic of Le Corbusier's functionalist paradigm, he too made use of the biological analogies that had featured in architectural discourse since the mid-eighteenth century (Collins 1965, 149). Wright's organicist model built on that of his mentor Louis Sullivan, who derived many of his ideas from the evolutionary theories of social Darwinist Herbert Spencer. Just as Spencer used biological analogies to describe social forms and structures as the product of different environmental circumstances, Wright conceptualised built structures as entities that grew naturally from their cultural and physical environment. Through this successful integration of setting, architectural structure, and ornamentation, a building could, like a living organism, form a unified whole (Wright 1955b, 296).

Wright's site-specific organicism appealed to O'Gorman, who had come to view European functionalism as incongruous with Mexico's natural and cultural landscapes.

The architect regretted that he had not discovered Wright before Le Corbusier as he considered the former's aesthetic to be closer to 'our true American tradition' (cited in Bamford Smith 1967, 18). While O'Gorman's admiration of Wright was sparked by a visit to his Fallingwater house in 1938, the pan-American sentiment behind this comment was influenced by Rivera, who had met Wright in the United States and depicted him in his mural *Pan American Unity* (1940). Rivera was particularly concerned that the imitation of Le Corbusien models had inhibited the development of an authentic national architecture in Mexico and claimed that the integration of pre-Columbian forms offered 'the only possibility of strength and health' in contemporary building design (cited in López Rangel 1986, 32). O'Gorman applied his own interpretation of organicism, which as Eggener notes deviated somewhat from Wright's original model (Eggener 1999, 175) to construct a small number of pre-Columbian-inspired buildings during the 1940s and 1950s. In collaboration with Rivera he designed the Museo Anahuacalli (1943–1957), a semi-pyramidal structure replete with ornamentation derived from Toltec and Mayan motifs, and a mosaic-decorated grotto house in San Pedregal (1956).

As these projects suggest, O'Gorman looked to organicism as a means of creating a more authentic vernacular architecture, but also of transforming buildings into true works of art (O'Gorman 1973b, 154). According to Wright, by overlooking aesthetic pleasure, the International Style had omitted 'what is beauty and what is human'. 'We want (them) together', he insisted, 'we want the poetry of the thing' (cited in King Hession and Pickrel 2007, 36). Rivera's and O'Gorman's use of physiological metaphors to articulate this new set of architectural values in their later writings reveals a line of continuity between their functionalist and organicist phases. As in the cases of Le Corbusier and Wright, their predilection for such metaphors can be primarily attributed to a long-standing reliance on biological comparisons in architectural discourse (Collins 1965, 155). In statements made by both men during the 1940s and 1950s the aesthetic elements of architecture are reconceptualised as a form of corporeal nourishment. Discussing the Olympic stadium at the Universidad Nacional Autónoma de México (1950–1952), which O'Gorman considered exemplary of the organic style, Rivera equates the body's need for aesthetic beauty with its nutritional requirements:

Architecture, as it is designed for human beings, cannot be truly functional if it does not satisfy the needs of the endocrine-sympathetic system, which are as important as those of the digestive system, that is to say, the need for aesthetic emotion through the presence of what we call beauty and which are the harmonious conditions capable of provoking that emotion in human beings. (Rivera 1986b, 123)

In a similar vein, O'Gorman employs digestive metaphors to explain the need for aesthetic fulfilment, comparing extreme architectural rationalism to a kind of nutritional supplement which, despite its utilitarian efficiency, is so unpalatable that it is rejected by the stomach.

If there were dishes on this table to be eaten and a doctor told us that one contained every vitamin and was nutritionally complete because every food has been mixed into it using a food processor, imagine how it would taste. Despite its nutritional efficiency we would throw it away because we would vomit if we ate it, regardless of its 'maximum nutritional efficiency for the minimum effort in cost'. (O'Gorman 1982b, 108)⁹

The similarities between these physiological metaphors reveal how O’Gorman’s and Rivera’s architectural philosophies remained remarkably compatible even after they distanced themselves from functionalism. While their continued use of an almost technical medical language to evaluate the importance of aesthetic pleasure and emotion in architecture indicates lingering traces of a technical approach, both statements mark a clear break from functionalist theories regarding the relationship between art and architecture and between built spaces and their human inhabitants. In contrast to O’Gorman’s earlier writings, where the inclusion of ornamental features to enhance human emotional and spiritual well-being is likened to the excessive and damaging consumption of alcohol, artistic elements are here described as a vital source of sustenance. Specifically, O’Gorman’s gastronomic analogy plays on the notion of aesthetic ‘taste’. By metaphorically comparing habitable spaces to food, architecture is presented as something that is essential for human survival, but that should also produce pleasure by stimulating sense perception. By placing greater emphasis on human aesthetic needs, these metaphors reverse the imbalance between aesthetic form and function established in functionalism. While O’Gorman included murals by state-sponsored artists in several of the schools he constructed in the 1930s, his later projects are founded on a more complete fusion of art and architecture. The reintegration of art and life in modern architecture, he claimed, ‘would serve as a shout of protest in favor of a humanism within the mechanical desert of the “marvellous civilization” in which we live, and whose aim is to destroy all expression that has as its base the humanist nature of mankind’ (O’Gorman 1973c, 296).

O’Gorman’s criticism of the dehumanising impact of technology in architecture was symptomatic of a more general unease among Mexican architects with the disciplinary dimensions of functionalism. Although Le Corbusier’s doctrine continued to shape large-scale public housing projects throughout the 1950s and 1960s, prominent architects such as Max Cetto and Luis Barragán moved towards a more human-centred organic approach. Barragán concluded that ‘the concept of building machines for living belittles the human being’ (cited in Bamford Smith 1967, 71), and developed a distinctly poetic style that emphasised light, colour, and surface texture. By developing his own approach to plastic integration, the German-born Mexican sculptor and architect Mathias Goeritz also configured a spiritually enriching architectural style as an antidote to functionalism’s oppressive fixation with logic and utility (Goeritz 1954, n.p.).

While they differed in their theoretical approaches, this collective impulse among mid-century Mexican architects to reverse the inhumane aspects of functionalist design is reflective of changing attitudes towards the state’s biopolitical vision of national progress during this period. Although several eugenics publications and organisations remained active into the 1960s, Stern asserts that the movement, having reached its peak in the 1930s and 1940s, began to wane in the 1950s (Stern 2011, 431). The atrocities committed under Nazi Germany’s racial hygiene programme also encouraged distrust of rationalism and an awareness of the dehumanising capacity of modern technology among left-wing Mexican artists and intellectuals such as Rivera and O’Gorman, both of whom publicly explored such themes in their murals. By the early 1950s critics had started to compare

functionalist housing blocks to concentration camps (Acevedo Escobedo 1952, 39), and in his essay 'Urbanismo estático y urbanismo dinámico' (1949) O'Gorman explicitly condemned Le Corbusier's urban planning as 'a fascist expression of thought' in its attempt to impose order on 'the complex organism of the city' (O'Gorman 1982d, 83). As these dramatic comparisons demonstrate, the doctrine of the French-Swiss architect, once integral to O'Gorman's utopian plans for radical social reform during the early reconstruction years, came to be closely linked to totalitarian mechanisms of biopolitical control by the middle of the century. While O'Gorman's relationship with others and his work grew increasingly troubled during the later stages of his career, both his and Rivera's embrace of the humane and democratic values of Wright's organicism indicates their enduring belief in the possibility of implementing an effective socially oriented architecture in modern Mexico. The physiological metaphors employed by both men shed light on the development of this shared thinking while also revealing their fundamentally organic conception of architecture's capacity to evolve and respond to the changing conditions of post-revolutionary society.

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Notes

1. All translations are my own unless otherwise noted.
2. After O'Gorman's death, his brother Edmundo stated that 'Cecil O'Gorman was not Juan's father, Diego Rivera was the father of Juan, my brother' (quoted in Xavier Guzmán Urbiola 2007, 29).
3. O'Gorman also constructed a smaller photographic studio for Frida's father, Guillermo Kahlo, which was never used.
4. In light of the corporeal ideals associated with functionalism, the building's design (particularly the elevated external staircase) seems an unusual choice of architectural style for Kahlo, whose mobility was increasingly limited in her adult life as a result of a childhood bout of polio and a catastrophic traffic accident she suffered at the age of 18.
5. Rivera stated that 'an architect must also possess the skills of the painter and the sculptor, if not, he is not an architect' (Rivera 1979b, 42), while O'Gorman argued that 'one cannot be an architect in the true sense of the word without being a painter and sculptor and vice versa' (O'Gorman 1986, 126).
6. Although *The Making* is not as overtly political as many of Rivera's other murals, the red star on the worker's breast pocket indicates his communist affiliations. Rivera had in fact been excommunicated from the Mexican Partido Comunista in 1929 due to his links with Trotsky and his acceptance of government commissions.
7. The three men depicted in the bottom central cell of the scaffold are the American architects Timothy L. Pflueger, Arthur Brown Jr, and the president of

the San Francisco Art Commission, William Gerstle. The architects in the bottom right-hand section are Micheal Goodman, Geraldine Colby Frikie, and Albert Barrows.

8. See López Rangel (1986, 41–42).
9. It is interesting to consider to what extent the digestive metaphors employed by Rivera and O’Gorman were affected by their own health problems. Rivera was put on a series of strict diets to alleviate ongoing liver problems from the 1930s onwards and in 1956 O’Gorman suffered from a debilitating intestinal infection that plunged him into a deep depression. Convinced that his condition was purely physiological, O’Gorman fasted for 39 days in an attempt to eliminate any fats from his body that may have contained toxins (O’Gorman 1973b, 160–161).

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