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Designing the ideal film studio in Britain

SARAH STREET

In 1944 a report was written by Helmut Junge, son of *émigré* film set designer Alfred Junge, as part of his studies for the Diploma in Town Planning at University College, London.[1] The report was published the following year as *Plan for Film Studios: A Plea for Reform*.[2] This work was supervised by Sir Patrick Abercrombie, the highly influential British town planner and architect who created the *County of London Plan* (1943) and *Greater London Plan* (1944), two seminal reports that promoted the 'new towns' movement and reforms designed to address London's growth, traffic congestion, housing conditions and distribution of public open spaces as the foundations of post-war reconstruction.[3] It is widely acknowledged that these 'provided the foundation for an extremely durable consensus about the future development of London, both at the level of public debate and within local and parliamentary politics'.[4] Although Junge's studio report was not referred to in the *Greater London Plan*, it had been intended to fit into its general framework and subscribed to many of its tenets. Writing in a preface to *Plan for Film Studios*, Abercrombie acknowledged its valuable contribution to studies of industrial location, in particular how a more 'conscious grouping' of studios in Greater London would address the problems that had arisen from haphazard planning and from workers living a long way from the studios in which they worked.[5] A review of the book in *The Architectural Review* stated: 'There is no doubt that the expansion of the film industry should fit into the national scheme of post-war reconstruction and location of industry'.[6]

Plan for Film Studios represents a strand of utopian thinking that involved re-imagining how Britain's studios might perform best as

1 Helmut Junge subsequently moved to Denver, Colorado where he worked as an architect and changed his name to Young.

2 Helmut Junge, *Plan for Film Studios: A Plea for Reform* (London and New York, NY: Focal Press, 1945).

3 Patrick Abercrombie and John Henry Forshaw, *County of London Plan* (London: Macmillan, 1943), and *Greater London Plan* (London: HMSO, 1944).

4 Frank Mort, 'Fantasies of metropolitan life: planning London in the 1940s', *Journal of British Studies*, vol. 43, no. 1 (2004), p. 121.

5 Patrick Abercrombie, 'Preface', in Junge, *Plan for Film Studios*, p. 3.

6 W. W. Kellner, 'A home counties Hollywood', *Architectural Review*, vol. 99, no. 1 (1946), p. 96.

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streamlined, efficient structures that were well situated in relation to their immediate surroundings. Inspired by approaches that depart from the common identification of studios with production companies and their outputs, this essay approaches studios as emphatically material sites, shaped by planners, engineers and designers focused on the creation of 'spaces of the imagination' within bespoke or more standardized architectural and technological environments. Jacobson has observed in relation to Hollywood's early film studios that studio architecture was characterized by 'fantastic functionality': that is, functional, utilitarian interiors combined with elaborate exterior facades that projected spectacular images of corporate branding.[7] This combination helped to persuade the local populace of Los Angeles that studios were beneficial to the area in physical, economic and symbolic terms. Although British studios never dominated London to the same extent as Hollywood's studios infiltrated Los Angeles, they similarly exceeded their function as factories for film production and cannot be separated from broader societal, economic and political issues arising from their design, function and locations.

While studios often recede from visibility to make way for the illusion of cinema, they are material sites embedded in the histories of technology and architecture, quasi-utopian designs on efficient labour, and moments of political and economic crisis and transformation. Using rarely examined sources that graphically document studios as working spaces – floor plans, photographs and maps – this essay shows how studios are, first and foremost, architectural spaces intended to support a number of functions depending on design, size, location and personnel. Jacobson has described studio architecture as 'the always present but rarely visible frame that lies just beyond the visual field', while also noting that it has played 'a key, but rarely acknowledged, role in the history of filmmaking'.[8] By taking architecture and infrastructure as foundational determinants of studio activity, the essay expands the notion of what studios are/have been as various models were generated. This approach benefits from placing British studios in the frame of tectonic approaches, which offer new ways of thinking about studios as material structures. As a term used most typically in geology to reference 'the movement of plates in the earth's crust producing seismic phenomena',[9] tectonics offers an analogous route to understanding the studios' multiple, stratified and shifting experiences as structures embedded within their local geographies but which changed, often significantly, over time and according to circumstance. Tectonics is also an architectural term that highlights interrelationships between structure, construction and constructional craft, as well as a building's 'narrative capacity [...] primarily with respect to itself, but also as a part of a more general circumstance (physical, social, political, economic etc)'.[10] From these perspectives buildings are 'self-conscious' bearers of intrinsic properties that tell their own stories.[11] Studio architectures are fascinating in this regard as they responded to technological change while exploiting the

7 Brian R. Jacobson, 'Fantastic functionality: studio architecture and the visual rhetoric of early Hollywood', *Film History*, vol. 26, no. 2 (2014), pp. 52–81.

8 Brian R. Jacobson, *Studios Before the System: Architecture, Technology and the Emergence of Cinematic Space* (New York, NY: Columbia University Press, 2015), pp. 2–3.

9 Pierre von Meiss, *Elements of Architecture: From Form to Place + Tectonics* (London: E. & F. N. Spon, 2013), p. 244.

10 Robert Maulden, *Tectonics in Architecture* (Thesis: MIT, 1986), p. 11; Kenneth Frampton, *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (Cambridge MA: MIT Press, 1995).

11 Maulden, *Tectonics in Architecture.*

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practical uses and artistic potential of materials integral to their construction. The 'integrative' elements of tectonic theory, which highlight 'the interwoven relationship between space, function, structure, context, symbolism, representation and construction', provide a framework within which to consider studios as imbricated within particular economies, technologies and cultures.[12]

12 Chad Schwartz, *Introducing Architectural Tectonics: Exploring the Intersection of Design and Construction* (New York, NY: Routledge, 2017), p. xxxii.

Studio planning was at the heart of post-war reconstruction for the film industry, making the need for rethinking the functionality of existing structures and locations particularly acute. The impact of the war had been severe: in 1939 there were 22 working studios with 65 stages and 647,652 square foot of floor space; by 1943 this capacity had reduced to nine studios with 30 stages and 330,702 square foot of floor space.[13] The de-requisitioning of studios after the war created an opportunity to reflect on the past and plan for the future. Looking back at earlier studio development in Britain shows that while there is some validity in Junge's claim that this had been 'haphazard', there were nevertheless several existing models of the 'ideal' studio structure that might deliver in essence a British version of 'fantastic functionality' while enabling a greater sense of the studios as examples of integrated, tectonic architecture. It will be argued that for all their merits and idealism, Junge's ideas were ultimately not enacted because of the film industry's post-war difficulties and practical barriers to re-organization in the wake of the 1947 Town and County Planning Act. Yet in some respects their spirit, or 'narrative capacity', pervaded the development of Pinewood, whose emergence as Britain's major studio was perhaps the most obvious beneficiary along with the reconstruction of Amalgamated Studios, Borehamwood, which Junge was able to assess at the planning stage. From this perspective utopian planning was firmly rooted in the experience of British studios as working, tectonic structures that developed over time. Before considering Junge's *Plan for Film Studios* in more detail, this essay will reflect on the development of British studios in the pre-war years from the perspectives of their architectural designs, material histories and cultures. As the following examples demonstrate, the quest for the 'ideal' studio pre-dated Junge's plan, prompted in particular by significant economic and technological changes affecting the film industry.

13 Junge, *Plan for Film Studios*, p. 20.

In the late 1920s British studio construction was considered to be 'in its infancy', very few studios had been built from scratch, and the most typical approach was to adapt existing buildings, such as a skating rink, an old railway electricity room, ballroom or former wartime factory, for film production.[14] In 1925 leading producer T. A. Welsh argued that: 'No existing British studio provides anything like adequate studio accommodation for the independent producing unit'.[15] He advocated the formation of a National Film Studio, to be located 20 to 30 miles outside London. Production companies could rent studio space, and a particular feature of the scheme was that it would be sufficiently capitalized to distribute films produced at the studios. While Welsh's idea never

14 Anon., 'Economy in production', *Kinematograph Weekly, The Kinematograph Studio* supplement, vol. 136, no. 1105 (1928) p. 87.

15 T. A. Welsh, 'Stabilising the industry', *Kinematograph Weekly*, vol. 101, no. 950 (1925), p. 40.

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materialized, its emphasis on co-operative action and the central co-ordination of facilities for production was indicative of the ways in which studios were at the heart of debates about the survival of the poorly performing British film industry.[16] It also anticipates several of Junge's recommendations in *Plan for Film Studios*. The advantages of designing a film studio for that specific purpose were becoming clear, and architects were urged to consult studio managers and engineers: 'It is only by collecting the ideas resulting from the actual experience of such specialists on the floor as producer, cameraman and engineer, that a fundamental basis for future work can be laid down'.[17] This sharing of expertise – particularly in areas such as electrical engineering, locating stores and plaster shops so they were accessible to stages, and other strategic logistical factors – was on the agenda just as the industry was faced with its most fundamental challenge since its formation. This approach can be related to ideas concerning 'tectonic expression' in architecture, particularly how as a 'bearer of intrinsic properties' a building 'can tell its own story', rooted in time and place and with elements such as walls, roofs and floors to create the general design of the structure.[18] The purpose of film studios was highly visible in their internal spatial configurations and open display of technology, lighting rigs, walkways, equipment stores, and so on. The studio's 'story' was part of its very fabric as a working structure.

The coming of sound caused a major rupture in Britain's film studios, while simultaneously galvanizing them within a short period of time to reconfigure studio spaces and equipment, and to collaborate with European partners for multi-lingual co-production. In 1928 there were 19 stages in British studios with a total area of 105,211 square foot of floor space.[19] By the end of 1932 many new stages had been built bringing the total to 33, and the total square footage had almost tripled to around 310,000.[20] This expansive context promoted utopian thinking in the form of a 'World Studio' scheme presented to the Board of Trade in 1930 by Sir Fred Maurice, Chairman of the Committee on Adult Education.[21] To encourage international co-operation and trans-linguistic understanding, studios had a new role to play. The idea for establishing in Britain a centre for production of International Talking Pictures was the inspiration of Sir Ernest Gordon Craig, a film renter who was general manager of the new sound newsreel British Movietone News. Maurice reported that the Midland Bank was prepared to underwrite the scheme, provided that the Government gave its encouragement in the form of a letter of approval from the Lord Privy Seal. The proposal did not, however, receive official sanction due to concerns about it being too speculative in the wake of losses recently sustained by the cluster of new film companies that had been formed following the passing of the Cinematograph Films Act, 1927. While there were attempts at multiple-language production in the early 1930s, mainly by the company British International Pictures, such initiatives were short-lived.[22] Yet Craig's idea drew attention to the potential for collaboration across borders and between studios. It also

16 T. A. Welsh, 'Give me leave to speak', *Kinematograph Weekly*, vol. 124, no. 1053 (1927), pp. 31–32. Other 1920s speculative studio schemes are described by Rachael Low, *The History of the British Film, 1918–29* (London: George Allen & Unwin, 1971), pp. 226–27.

17 Welsh, 'Give me leave to speak'.

18 Maulden, *Tectonics in Architecture*, pp. 11–13.

19 Board of Trade, *Minutes of Evidence taken before the Committee on Cinematograph Films, 1936* (London: HMSO, 1936), p. 59.

20 US Department of Commerce, *European Motion Picture Industry in 1932*, Martin H. Kennedy's report on UK (Washington DC: US Government Printing Office, 1933), p. 35.

21 Board of Trade records, BT 56/28/CIA/1428, National Archives, London.

22 Andrew Higson (ed.), *'Film Europe' and 'Film America': Cinema, Commerce and Cultural Exchange, 1920–39* (Exeter: Exeter University Press, 1999), p. 292. See also Paola Maganzani and Stephen Sharot, 'Transnational cinema and cultural adaptation in early 1930s Europe: the four language versions of *The Private Secretary*', *Screen*, vol. 61, no. 1 (2020), p. 30.

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indicates how centralization of European production required new structures and technologies – a new tectonic consciousness ushered by sound that had implications for older and new studios.

The impact of sound on studio infrastructures and equipment was immense, as recalled by John Scotland:

> Machinery and buildings built after years of experience and at huge expense lay idle, filled only with the echoes of the past and the clamour of the concrete mixers of the builders, who were breaking record after record in the mad rush to make places where films might be made to speak. Huge notices in the modern studio ask for absolute silence, and stolid commissionaires stand on guard under the red lamps. No one moves, only the actors seem alive, their voices curiously remote and unreal. Everything had to go by the board – cameras, studios, laboratories, and lights. The new studios are shells within shells. Not even the lintels of the doors may connect the inner and outer walls of these sanctuaries. Their very foundations are in duplicate and rest on vast mats of sand to ensure that not the slightest earth-borne tremor from the outer world shall intrude upon the tranquillity of the 'set'.[23]

23 John Scotland, *The Talkies* (London: Crosby Lockwood and Son, 1930), p. 66. John Scotland was a pseudonym for an unknown author. The book's preface by Cecil Hepworth however says that the author has 'an intimate knowledge of silent pictures from before the war and of talking machines from the days when those egregious instruments had dreamed of a union with cinematography' (p. vii).

Controlling sound was a major concern since sets could no longer be built on the studio floor while shooting was taking place, acoustic conditions needed to be carefully monitored, cameras had to be sound-proofed and 'sizzling' arc lamps had to be scrapped in favour of large incandescent lamps. Whether a studio was fit for purpose was the major question to be addressed by every manager during the 1930s, prompting ideas about restructuring existing spaces and designing entirely new ones. The material implications of sound cinema forced studios to adapt in ways that drew attention to their functionality as newly 'silent' spaces, as well as to their role in accelerating competition within the British film industry.

A report on the British Lion Studios at Beaconsfield in 1930 gives an idea of the typical adjustments that had to be made to accommodate sound.[24] Controlling the reverberation of sound was a major consideration, requiring corrective internal measures that included lining the studio walls and ceiling, making the roof air-tight and filling the floor from the ground up with an expansive material that completely filled the space under the boards. The ARP Studios at Ealing, on the other hand, were built as new and with sound technology incorporated as a major factor in their design. Described as 'among if not the most modern in Europe', the steel-framed building had solid brick walls to house two stages. Each was divided by a wall carried on insulated foundations to reduce noise and vibration between them. Sound-proofing materials were used to further insulate the walls, 'forming an internal shell right round the studio'.[25] Doors were made to operate smoothly, and with the ability to be firmly clamped shut. The doors in the main entrance opened and closed vertically, each rising from and falling into a tight-fitting trench

24 *Kinematograph Weekly, Kinema and Studio Design and Equipment* supplement, vol. 158, no. 1198 (1930), pp. 3, 5, 7.

25 *The Architects' Journal*, 16 December 1931, p. 798.

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below the floor to provide complete insulation and a reduction of noise. This latter gives a good example of tectonic design in which the mechanics of sound-proofing were exposed and visible, expressing how the studio was indeed ‘ok for sound’. Whereas noisy studios were previously a sign of activity and health, the coming of sound reversed this situation, requiring a new narrative. A well-functioning studio was now ideally a silent one, made all the more possible by the introduction and visual display of new materials, structures and equipment; the coming of sound involved silencing the technology, while bringing it more obtrusively into sight.

The new Gaumont sound-film studios built between 1930 and 1931 at Lime Grove, Shepherd’s Bush, were designed specifically for the requirements of sound films. The original French-owned complex was built in 1915, and after its purchase in 1922 it was managed by Isidore, Mark and Maurice Ostrer of the Gaumont-British Picture Corporation. The new, steel-framed building was designed to use space vertically in a compact manner, which was an important consideration given that the studios were closer to the centre of London than most others. The ground floor was used for dressing-rooms, offices and workshops. Materials from the latter were transported using an electronic lift that serviced all floors. The three studios – one large and two smaller spaces – were on the upper floors, and the building’s flat roof could be used to shoot scenes in the open air.[26] The Gaumont studios were designed by S. B. Pritlove, an architect known for art deco cinema designs and as co-designer in 1928 of the art deco-inspired Holland Park Synagogue in London. Located next to existing buildings, the contrasting streamlined appearance of the new studios’ outer facade with its geometric windows and white-bricked exterior with a base patterned with multi-coloured bricks, strikingly resembles Bauhaus architecture and its principles of ‘form follows function’ (figure 1). This is a perfect example of the building’s outer appearance relating to its inner function in the ‘integrated’ conception of tectonic architecture discussed by Frampton as embodying ‘poetic’ construction.[27] It is as if a new concept for studios has been announced with a suitably ‘modern’ appearance, a British variant on the ‘fantastic functionality’ of Hollywood’s early studios. The building was designed to stand apart from, rather than blend into, its local environment. The generation of architects who worked with Bauhaus *émigrés* such as Walter Gropius indeed had a lasting influence on British architecture which extended into post-World War II planning.[28]

The film industry’s expansion in the 1930s provided further opportunities for architects to design functional studio complexes that exuded modernity and a spirit of creative innovation and enterprise. This substantial increase in activity meant that by 1937 there were 23 studios with a total floor area of 781,202 square foot;[29] it included extending existing spaces and the opening of two high-profile new studios in 1936 – Denham and Pinewood – which shaped British film production over the next decades, and in the case of Pinewood still operate today.

26 *The Architects’ Journal*, 27 January 1932, pp. 146–48.

27 Frampton, *Studies in Tectonic Culture*.

28 ‘How the Bauhaus left its mark on Britain’, *Financial Times*, 20 September 2019, <https://www.ft.com/content/b7e1b084-d859-11e9-9c26-419d783e10e8> accessed 9 May 2021

29 H. Chevalier, ‘Technical survey of studios’, *Kinematograph Weekly*, vol. 251, no. 1604 (1938), pp. 138–39.

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Fig. 1. GaumontStudios, Lime Grove, Shepherd's Bush, 1932.

The advance was so great that some commentators expressed concern that the boom in studio-building depended on increased production, and thus on US companies extending their influence in the UK.[30]

The studio that caused most comment was Denham, located west of London in Buckinghamshire and completed in May 1936. It was built on a 195-acre site on an estate called 'The Fishery', crossed by the River Colne, north of Denham Village. The site was purchased from Lord Forres by Alexander Korda's London Film Productions, a company that had attracted financial backing from the Prudential Assurance Company

30 P. L. Mannock, 'Studio survey', *Kinematograph Weekly*, 21 May 1936.

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and had its films distributed by United Artists, the US company in which Korda was a partner.[31] These credentials associated the new studio with expansion, glamour and ambition, an image that befitted its curvilinear art deco exterior around the building's steel frame. Seen from the front it was a longitudinally designed building on the North Orbital Road called the 'administrative block', housing the reception area, dressing rooms, central offices and film review theatres. Korda's main office was located in an old red-brick mansion close to the river. A covered gallery connected the main building with the stages, the largest of which, when viewed from the front, appeared as three structures jutting up on a higher level, each announcing one word of the company's name – London Film Productions – using a plain, symmetrical monostroke font that reflected the studio's modernism (figure 2). *The Architects' Journal* noted how, compared with older studios, the 'solid construction' of modern complexes like Denham invited innovative design choices because they permitted 'a better appearance to be obtained from the elevational point of view; the actual film-making buildings have to be lofty and windowless'.[32] In 1932 the architects, Messrs Joseph, had designed Shell Mex House, an imposing art deco building in London, so the style was in keeping with their interest in modernism. Denham similarly stood out as a streamlined example of 'fantastic functionality'. Jack Okey, American designer of First National and Paramount Studios, also advised on the studio's plans. Surviving images of Denham's interiors show that spaces such as the lobby, with its tiered upper floor space and curvilinear ceiling (figure 3), the geometric patterning on stairway features at the entrance to the screening theatre, and the restaurant with its art deco-inspired bar fixtures, were also marked by modernist, streamlined design principles, displaying associated materials such as stainless steel and chrome that expressed the studio's technological sensibility.[33]

The processing laboratories alongside the administrative block were designed by the Bauhaus-founder Gropius (figure 4), who had moved to Britain in 1934 as a refugee from Nazi Germany following an invitation to work with architect Maxwell Fry in the architecture and town-planning firm Adams, Thompson and Fry.[34] Gropius joined the Modern Architecture Research Group and worked on designs including an unrealized private housing development in Windsor, and an elegant house in Chelsea for the writer and film director Benn Levy and the actress Constance Cummings.[35] From a creative point of view, however, Gropius's experience with Denham was not entirely successful. He felt constructing the laboratories had been rushed, complaining that he had been insufficiently consulted by the builders and did not like the final result.[36] Even though Denham's art deco design is not typical of the exteriors of British studios in the 1930s, its much-publicized construction made it a symbol of the British film industry's international ambitions. Occasionally the exterior performed an additional function as a film set, as when one of the studio entrances replicated an art deco cinema frontage in *Brief Encounter* (David Lean, 1945); in such doubling-up, a

31 Sarah Street, 'Alexander Korda, Prudential Assurance and British Film Finance in the 1930s', *Historical Journal of Film, Radio and Television*, vol. 6, no. 2 (1986), pp. 161–79.

32 K. S. Cradduck, 'Planning for the film industry', *The Architects' Journal*, 6 May 1948, p. 412.

33 *The Architects' Journal*, 3 December 1936, p. 774.

34 Iain Jackson and Jessica Holland, *The Architecture of Edwin Maxwell Fry and Jane Drew: 20th Century Architecture, Pioneer Modernism and the Tropics* (London: Routledge, 2014), p. 63.

35 James Lewis, 'Walter Gropius in England, 1934–37: adaptation, expectation and reality', *Docomo Journal*, no. 40 (2009), pp. 4–7.

36 Fiona MacCarthy, *Walter Gropius: Visionary Founder of the Bauhaus* (London: Faber, 2019), p. 340.

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Fig. 2. Denham Studios exterior, 1936.

studio's design could

Fig. 3. Interior balcony and ceiling of entrance hall, Denham Studios.

Fig. 4. Denham Film Laboratories designed by Walter Gropius.

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literally embody and express its function (figure 5).[37] In this case the cinema is where the characters can escape the social conventions that otherwise conspire to forbid their romance. The set serves as a reflexive gesture that highlights a more ‘modern’, outward-looking world, represented by cinema and, by implication, the studio where it was filmed.

Many international commentators reported on Denham’s opening and its first years of activity. Journalist and writer Otto Behrens described it as ‘a production facility that could not be more ideally imagined as a blueprint’.[38] It was visited by architect Gino Peressutti when Cinecittà, Italy’s flagship studio, was being designed in the mid 1930s. Both Denham and Cinecittà were modern film complexes located in largely rural surroundings. Peressutti likened Denham to a well-organized, industrial plant with each production stage spread out and accessible via a perpendicular building (the art deco structure). Cinecittà, on the other hand, was like a ‘walled and gated miniature city’, with stages located closer together.[39] Beyond the facade one encountered a large square featuring geometric lawns, palm trees and Mediterranean pinewoods as a co-ordinating entrance point to the stages and studio facilities; it was an impressive gateway to modern film production facilities.[40]

French set designer Lucien Aguettand visited Denham in December 1936, writing a long report discussing many of its specifications. He admired the ‘beautiful facade’ and how ‘everything was built according to a logical plan whose initial object has been to distribute the various services and premises in the most rational way and for the best use’.[41] In anticipation of later criticisms, Aguettand was not so impressed with the organization of equipment, observing a ‘disordered’ accessory store, lack of both a water supply to the stages and of a pool facility under their

37 Teddington’s exterior was frequently used as a set, as noted in *The Architects’ Journal*, 14 January 1937, p. 79.

38 Otto Behrens, ‘New films at Denham’, *Schweizer Film = Film Suisse*, vol. 3, no. 51 (1937), p. 1.

39 Noa Steimatsky, ‘Backlots of the World War: Cinecittà, 1942–50’, in Brian R. Jacobson (ed.), *In the Studio: Visual Creation and its Material Environments* (Oakland, CA: University of California Press, 2020), p. 123.

40 Sara Martin, *Gino Peressutti: l’architetto di Cinecittà* (Udine: Forum, 2013), pp. 96–99.

41 Lucien Aguettand, ‘Visit to the studios of Korda’s London Film Productions’, Archives de la Cinémathèque Française, fonds Lucien Aguettand, 167 B9.

Fig. 5. Alec (Trevor Howard) and Laura (Celia Johnson) outside the cinema in *Brief Encounter* (David Lean, 1945), filmed using an entrance to Denham studios.

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floors (necessary if the film required water scenes, though an exterior pool was also available), while also noting that 'everything is too new in these studios and everything seems unorganised and incomplete [...] making economies does not seem to worry the producers of Denham'.[42] American cinematographer Ray Rennahan filmed *Wings of the Morning* (1937), Britain's first Technicolor feature film, at Denham. He reported more favourably that 'The newer British studios are quite on a par with any in Hollywood', often having state-of-the-art equipment, covered walkways and number of large sound stages 'at least as large as Stage 5 on the United Artists lot'.[43] The equipment included Mitchell NC cameras, Super Parvo French cameras Mole & Richardson Fresnel spot lighting and a mobile rear projection system.[44] Expensive gamble or not, Denham attracted the world's attention as no British studio had done before. Its inner and outer construction was integrated into a studio complex that projected a self-conscious narrative of functionality, streamlined industry and progress.

42 Ibid.

43 Ray Rennahan, 'Colorfilming in a British Studio', *International Photographer*, vol. 8, January–December 1936, p. 8.

44 H. Mario Raimondo-Souto, *Motion Picture Photography: A History, 1891–1960* (Jefferson, NC: McFarland, 2007), p. 167.

Denham's location fifteen miles out of London on the North Orbital Road, a new road built in the early 1930s that provided easy access to the capital, created a striking visual contrast with the rural, picturesque Denham Village. One evocative report captured something of the incongruity of seeing a modernist-looking film factory emerging in the distance when travelling to Denham from central London by train, using a new fast service which had been especially arranged by the Great Western Railway:

> Fifteen miles out of London a thick plantation of pine trees hides the view to the right of the line. Suddenly, through the pines glows a fierce purple light, like a giant oxy-acetylene welder. A moment later the trees that swept past to reveal a great mass of buildings, still white in the gathering darkness. Every window blazes with light, and little figures can be seen hurrying from room to room. In the dazzling purple glare there stand the skeletons of scaffolding and strange façades, while high up on a rostrum a tiny figure standing by a tripod waves its arm. A second afterwards the buildings of a small country station blot out the whole scene, and as the platform roars past you glimpse the name of the station – Denham.[45]

45 Film Council, 'Secrets of British Film Finance', *World Film News*, January 1937, p. 18.

Michael Powell also remembered Denham's appearance as an awesome sight:

> The stages of Denham stood in a formidable row along the new road [...] I had caught a glimpse of the machine shop and the carpenters' shops and the electrical stores. This was how a film studio should be! A box of tricks out of which to create marvels.[46]

46 Michael Powell, *A Life in Movies* (London: Heinemann, 1986), p. 267.

These remarks demonstrate how Denham's outer form was rooted in the time and space of its construction, expressing its 'inner-consciousness' or relationship to its surroundings. The apparent dichotomy between its modernist appearance and the rural landscape drew attention to its

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potential as regenerative for the area, indeed as a local ‘event’ that was now part of the landscape and would remain so thereafter. Denham’s ‘inner consciousness’ or substance was integrated with what Maulden terms the ‘depth-ness’ associated with tectonic conceptions of architecture in which ‘outer form’ and ‘inner substance’ are interrelated.[47]

47 Maulden, *Tectonics in Architecture*, p. 13.

Denham’s specifications were indeed impressive, with seven stages totalling 110,500 square foot of stage area. The stages were accessed by large, insulated sliding doors that were vertically moved by electric control so that parts of previously assembled sets could be brought to the stages. It was the biggest studio in Britain, with air-conditioned and sound-proofed stages, electricians’ galleries in the roof, its own water supply and the largest diesel-driven electrical power plant used at that time by a private company. Two thousand people were employed in production, working in the 14 self-contained cutting rooms, the machine shop, foundry, plumbing and blacksmiths’ shops, the wood-working mill, shops for carpenters, plasterers, painters and electricians, stores for small props, stage equipment, make-up and property. The stages were sound-proofed by insulated, square-patterned cladding, and this crucial aspect of sound filmmaking was visible as part of the building’s tectonic form and function.[48] No other studio had its own processing laboratories: one for negative developing, daily prints, master positives and duplicate negatives; a second for release prints. Technicolor laboratories were also established at Denham. As one advertisement stated: ‘Words can hardly describe the wonders of the new studios, where every convenience has been studied and every worthwhile idea in the design, layout and construction of modern film studios has been embodied’.[49]

48 *The Architects’ Journal*, 3 December 1936, p. 777.

49 Advertisement quoted in Sarah Street, ‘Denham Studios: the Golden Jubilee of Korda’s folly’, *Sight and Sound*, vol. 55, no. 2 (1986), p. 118.

These celebratory sentiments were the core address of *A Day at Denham*, a promotional short film released by London Film Productions in 1939.[50] For viewers at the time the film provided unique access to the spaces and activities normally hidden from public view, demystifying film production while at the same time creating an aura around the variety of specialized work that took place in the studio. In the 1930s public interest in studios was served through newsreel coverage and novel publicity campaigns such as a series of cigarette cards advertising the practices and technologies used at Gaumont-British’s main studio at Shepherd’s Bush.[51] *A Day at Denham* performs an additional function today in that it documents Denham’s long-gone past as functioning studios that have since been transformed for other purposes; the narrative has changed over time from a celebration of modernity to commemorating the past. In 2017 Denham was converted into a luxury apartment complex that takes pride in its former history as a film studio by replicating its art deco architecture, restoring the original cinema and bar as residents’ facilities.[52] Yet the conversion bears few traces of the studio’s operational past, or of how Denham functioned as a workplace that was galvanized by complex technical and creative activities. Whereas today the conversion is marketed as a luxurious, calm domestic haven for commuters working in London, *A Day at Denham* opens with

50 The film is available to view on BFI Player, <https://player.bfi.org.uk/free/film/watch-a-day-at-denham-1939-online> accessed 10 May 2021.

51 Richard Farmer, ‘Publicising the studio: cigarette cards – “How films are made”’, *Studiotec* blogpost, July 2020, <https://studiotec.info/2020/07/> accessed 10 May 2021.

52 See the Weston Homes brochure for the apartment development, <https://www.weston-homes.com/the-denham-film-studios/> accessed 10 May 2021.

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a vision of the opposite: shots of Denham village as a sleepy, pastoral hideaway are followed by crowds of employees clocking on inside the busy studio. This captures something of the incongruous sight referenced earlier that greeted those who travelled from London to Denham by train and were amazed by the contrast between the pastoral locale and the studios' spectacular art deco facade, an appropriate symbol for a modern film factory. Denham's impact on the local landscape and economy was demonstrative of its buildings' 'narrative capacity', an example of the 'depth-ness' identified by theorists as a feature of tectonic architecture.[53] While *A Day at Denham* emphasized the dichotomy between rural setting and modern film factory, the studio's location on the North Orbital Road and the increasing speed of rail connections made it part of the area's new, infrastructural development, connecting it more closely to London; Denham offered a new vision that signalled the area's future direction.

53 Maulden, *Tectonics in Architecture*, p. 11.

The processes involved in Denham's activities are also well-documented in *A Day at Denham*, giving the viewer access to the material environment of film production, from doing the actors' make-up to constructing sets, building models and cutting films (figures 6 and 7). This obtrusive display of *techne* emphasizes the buildings' integrated construction, internal and external organization, even to the extent that the work of film production 'spills out' into the exterior spaces near the river Colne (figure 8). Exterior sets, including a railway station and permanent recreations of whole streets, are shown being erected in the vast space of the back-lot. The studio's operation has added new functionality to the area, opening it up to new meanings that change over time. Interior shooting on the stages of well-known London Film Productions' films is also documented, including *Fire Over England* (William K. Howard, 1937), *Knight Without Armour* (Jacques Feyder, 1937), *South Riding* (Victor Saville, 1938) and *The Four Feathers* (Zoltan Korda, 1939). The fact that London Films filmed Denham's activities over several years signals a desire to make the most of its moment as Britain's most modern studio complex. Although functioning studios occasionally featured in newsreel items, a film with the same level of detail as that found in *A Day at Denham* is rare. Its release may well have been strategic, perhaps to offset criticisms of Korda's over-ambitious production programme and studio management. Writer Jeffrey Dell satirized the studio in *Nobody Ordered Wolves*, a novel published in 1939 that alluded to financial mismanagement by large film companies through such ruses as keeping a number of unmade productions 'stuffed with production value' on the books so that they could be registered as assets.[54] London Films incurred losses due to an over-extended production plan on expensive films that did not generate sufficient profits. The Prudential Assurance Company threatened to withdraw its financial support and United Artists despaired of what it considered to be Denham's mismanagement. Korda was forced to relinquish control in 1939 when J. Arthur Rank took over the studio and it merged with

54 Jeffrey Dell, *Nobody Ordered Wolves* (London: Guild Books, 1939), p. 140.

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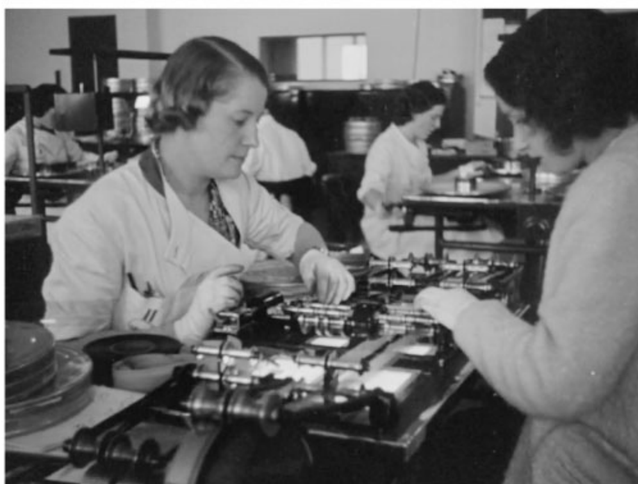

Figs. 6–8. ***A Day at Denham*** **(London Film Productions, 1939), showing (from top): the model shop; editors; Denham's building sets.**

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Pinewood, the studio opened a few months after Denham, to form D & P Studios.[55]

In spite of being publicized as state-of-the-art, when Junge studied British studios in the early 1940s he nevertheless concluded that Denham was not ideal.[56] A gap was perceived between the streamlined facade and functionality of the interior layout; Denham's tectonic architecture was yet to be perfected (figure 9). The main problem was that the layout was too spread out: the workshops, property store, carpenter's shop, camera and loading rooms were so far from the stages that quick and easy transportation of property and equipment was impossible. In addition, the plasterer's and pattern shops were not close enough to the main carpenter's shop. While the number of stages was considered good, only two of them were sufficiently large to ensure the best dimensions (length approximately twice width, at 250 by 125 foot) for acoustics/sound recording. Although the stages had removable floors, in practice this facility was not used as a means to storing sets, which were usually constructed on two levels on rostrums. There were no permanent, coverable storage 'pits' that could have stored sets when they were not in use. Although the power house was considered an asset, its location close to the stages and art department meant these areas were affected by noise and dirt. The centralization of the dressing rooms and offices involved long walks along draughty corridors for those engaged on the stages. This caused difficulties if the stages were rented to a number of different companies, necessitating the erection of temporary dressing or rest rooms on the stages, which took up valuable floor space. Unfortunately, as London Film Productions became financially unstable the need to rent out the facilities became acute, since this was the most lucrative aspect of studio business. In addition, the cutting rooms were also a long way from the screening theatre, adding to the time it took to review rushes, and the canteen and restaurant were at opposite ends of the studios, essentially separating technicians from the executives, actors and high-profile visitors who frequented the restaurant.

Junge's recommendations for the 'ideal' studio involved a re-design of Denham to correct these weaknesses. A key factor was to improve communication between units and departments and thus to reduce delays in production. John Aldred, a sound recordist and dubbing mixer who worked at Denham between 1938 and 1942, recalled that the layout could cause logistical problems:

> Denham was a curious place because it was newly built but it wasn't very well designed. For instance all the shooting studios, stages you call them, were all in a line. You came to them on the main road all in a line. And the dressing rooms were all in a line. And way away in a corner of the lot were all the workshops, where the scenery was made and the paintshop and the plasterers were. So the studios had a whole lot of beautiful low loaders, mechanical trucks with very low loading platforms tearing around, taking equipment a quarter of mile there and

55 Street, 'Denham Studios: the Golden Jubilee of Korda's folly', pp. 116–22.

56 Junge, *Plan for Film Studios*, pp. 21–22.

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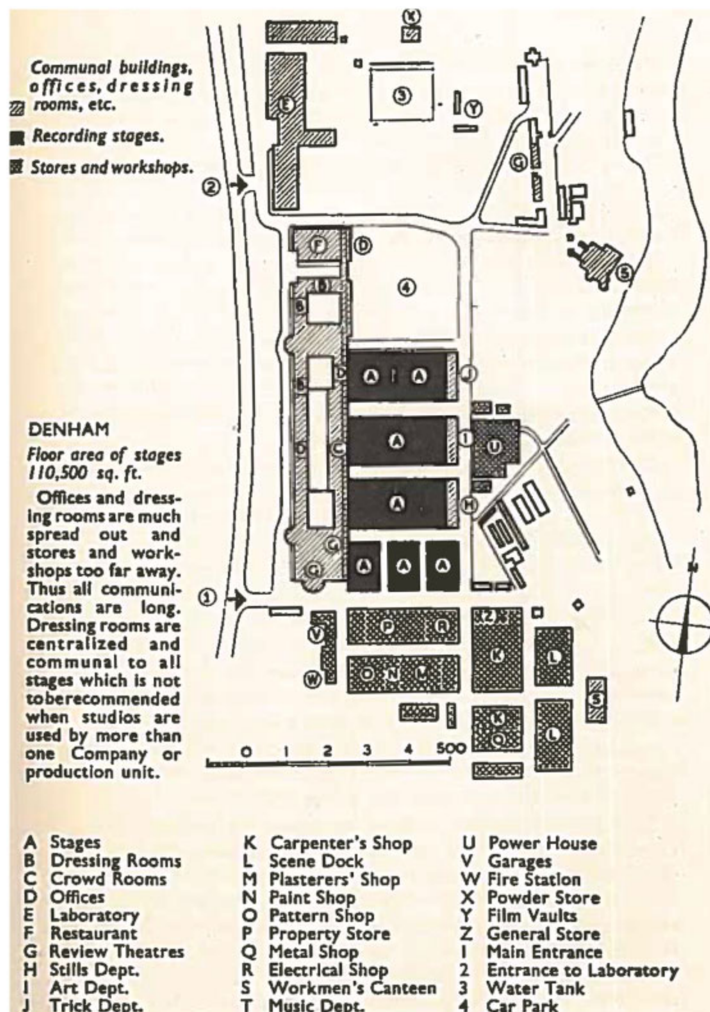

Fig. 9. Helmut Junge's plan of the Denham layout, from *Plan for Film Studios* (p. 21).

> back. It was rather a tedious business carting scenery up and down, it was an expensive studio to run. The stages themselves were interesting. I can remember it was the first time I'd been in a film studio where they had lighting gantries suspended from the roof. If we'd done that at Shepperton the roof would have caved in.[57]

Art director Carmen Dillon also recalled that working at Denham involved very long walks down the 800-foot main corridor: 'One was always going up and down it. And they got angry if you used a bicycle, which I did always!'[58] When the film critic C. A. Lejeune visited Denham she was struck by this feature:

> The main block of Denham is pierced by two long corridors, parallel with the main avenue, connected at intervals by glass-walled bridges

57 John Aldred, BECTU interview no. 102, 17 September 1989, 17 December 1989. British Entertainment History Project.

58 Carmen Dillon BECTU interview no. 288, 23 June 1993. British Entertainment History Project. The corridor's length is given in Ross Williamson, 'London Film Studios, Denham', *The Architectural Review*, vol. 80, no. 480 (1936), p. 192.

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> and separated by formal gardens bright with flowers. These corridors are the most characteristic things about Denham. They seem to run on for ever, like the endless vistas of a nightmare. Every twenty yards or so you push open a swing-door and another reach of corridor opens in front of you.[59]

59 C. A. Lejeune, 'Modern films in the making', *The Observer*, 31 October 1937, pp. 19–20.

The corridors and glass-walled bridges constituted a kind of connective, umbilical linkage between Denham's buildings that expressed its integrated structure (figure 10). Colour-coded lines on the walls served as directions for workers and visitors who might be unfamiliar with the layout. The lighting gantries admired by Aldred are also a good example of tectonic expression since the exposed mechanical and electrical systems were integral to the stages' architectural design and appearance.

Junge's more compact layout for Denham was designed to cut by two-thirds the average distances from stores and workshops to stage doors.[60] To prevent the transference of noise and dirt the power house was further away from the stages and the art department, but the cutting rooms were still a long way from the review theatres. The canteen was nearer to the restaurant but still separated by stages and workshops, therefore maintaining the social distance between spaces of the former arrangement. For all its shortcomings, Denham nevertheless was instrumental in shifting the centre of importance in terms of the location of British studios 'a whole compass point from the north to the west of London'.[61] The west offered fog-free spaces, spacious land, gardens and stately homes that could be used as sets. This opportunity was taken up by Charles Boot, chairman and managing director of a building company who in 1935 acquired a country estate not far from Denham in Iver

60 Junge, *Plan for Film Studios*, p. 45.

61 P. L. Mannock, 'Our studios of the future', *Kinematograph Weekly*, Supplement, vol. 236, no. 1537 (1936), p. iv.

Fig. 10. The long corridor at Denham.

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Heath, Buckinghamshire, where he co-developed a new studio project with flour mill entrepreneur and religious filmmaker J. Arthur Rank, who became the first chairman of Pinewood Studios Ltd.

Pinewood was designed by consulting architect A. F. B. Anderson, later known for theatre reconstruction work, and H. S. Scroxton, who was responsible for architecture and construction of works. Anderson worked in the same practice as Robert Atkinson, who designed many iconic art deco buildings. Art deco was not however chosen for Pinewood which relied for its visual identity and 'fantastic functionality' on the historic splendour of Heatherden Hall, the large Victorian mansion with an elegant columned frontage on the 100-acre estate purchased by Boot. In this sense there was something of a schism between the decorative Hall and the workings of a modern film studio. Pinewood did not replicate Denham's modernist, tectonic integration of exterior and interior. The new studio was also more isolated than Denham, with no nearby railway line or public bus route. The studios were located well back from the main road on the parkland north of the house (figure 11). After passing through a double lodge, workers and visitors encountered a marble figure of Prometheus, which symbolised the spirit of invention therein. The luxurious mansion, complete with a Turkish bath, library, music room, gymnasium, swimming pool and beautiful gardens, was the location of the 'Pinewood Club', a residential and social club 'for members of both sexes and their friends, interested and/or engaged in the development and advancement of the British Film Industry'.[62] The three-storey administrative block adjoining Heatherden Hall had a board room panelled with the inlaid, gilded library from the RMS *Mauretania*, the

62 Pinewood Club members' book: Lazare Meerson, 20 July 1938.

Fig. 11. Heatherden Hall.

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ocean liner scrapped in 1935. Pinewood's self-conscious 'narrative' that emphasized luxury, harmony and beauty was thus distinct from Denham's modern, streamlined character. The importance of establishing a congenial atmosphere was stressed by Richard Norton, former banker and managing director of Pinewood:

> Every care and consideration has been used to make what is ostensibly an industrial centre a harmonious whole with its inspiring surroundings, but I take pride and pleasure in being able to state with confidence that producers, stars and staff can live, eat and work under comfortable, healthy and beautiful conditions, that cannot be found in any other studio in the world [...] These new studios have in some curious way developed a definite personality of their own, and I shall do everything possible to foster their glamour, a quality hitherto non-existent in our film world.[63]

The idyllic pastoral surroundings, country mansion and luxurious club connoted a traditional 'personality', or image of Englishness, whereas the streamlined, art deco facade and Korda's network of *émigré* professionals associated Denham more with a modernist, cosmopolitan ethos. While many of London Film Productions' films were set in the past, the studio's modernist spirit was clearly imprinted on films such as the Le Corbusier-influenced designs by Vincent Korda for *Things to Come* (William Cameron Menzies, 1936; shot at Denham and at Worton Hall, Isleworth) and *The Divorce of Lady X* (Tim Whelan, 1938), which featured art deco interiors by Lazare Meerson, an *émigré* set designer known for his preference for the style. Korda's public profile as a charismatic, innovative producer undoubtedly conferred a touch of glamour on Denham. Graham McCallum, a sound engineer who worked at Denham Pinewood and Elstree in the late 1930s, recalled that Denham's sound department had a reputation for being 'a bit snooty', on account of Korda's reputation and the extensive press coverage of the many ambitious films made at Denham.[64] Rank, on the other hand, was an entrepreneur interested in producing and distributing religious films, a background that could not compare with Korda's glittering reputation as the director of *Private Life of Henry VIII* (1933), a box-office success in Britain and, unusually for a British film, also in the USA.[65]

A survey of productions for 1936 to 1938 shows that the 31 feature films produced at Denham and 49 at Pinewood tended in general to reflect the studios' different images. Denham's films were marked by an emphasis on spectacle, pageantry and internationalism, many with high budgets and employing *émigré* professionals. Five films were shot in Technicolor, compared with only one at Pinewood. At Denham more use was made of the studio lots for exterior sets, and of foreign locations such as India for *The Drum* (Zoltan Korda, 1938) and the Italian Alps for *The Challenge* (Milton Rosmer and Luis Trenker, 1938). Denham's expansive image, expressed by its long, narrow layout and extensive exterior lots, was conducive to the ambition of its pre-war output, even if

63 Richard Norton, 'The functions of Pinewood', *Kinematograph Weekly*, Supplement, vol. 236, no. 1537 (1936), pp. iii–iv.

64 Gordon McCallum BECTU interview no. 58, 10 November 1988. British Entertainment History Project.

65 Sarah Street, *Transatlantic Crossings: British Feature Films in the USA* (New York, NY: Continuum, 2002), pp. 47–55.

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this involved financial over-extension and accusations of mismanagement from the Prudential. Pinewood's productions, by contrast, tended to have a lower budget and were less likely to use exterior lots or location shooting. *The Observer*'s film critic C. A. Lejeune described it as 'the neatest studio I have ever seen; a small but shining model factory in the heart of a model village'.[66] The emphasis on musical comedy, musicals, crime thrillers and use of British stars from radio and popular theatre connoted a domestic, studio-based ethos facilitated by Pinewood's compact layout and self-contained stages, which enabled studio-based realism that on occasion showcased feats of technical ingenuity. One of its largest stages, for example, was used for the Grand Hotel set and sequence in *Young and Innocent* (Alfred Hitchcock, 1937), which featured a spectacular, long crane shot, 'impossible from human vision', that ranged from a distance of 145 feet across a crowded dance floor to an extreme close-up of the villain's twitching eyes as he plays the drums on the stage. This celebrated shot was described as 'a technical triumph necessitating the use of a special lens and mount which were invented for the occasion by the Gaumont-British camera department'.[67]

Boot took a personal interest in the planning of Pinewood, following discussions with Sir Auckland Geddes and Sir John Henry about designing the ideal studio in Britain. Hollywood's studios were researched, and Jack Okey, who had been involved in Denham's design, was consulted during the process. In addition, the Ufa studios in Berlin were studied by James B. Sloan, former production manager for Basil Dean and British National, who advised on Pinewood's technical equipment and became its first general manager. Sloan had experience working in Europe, in particular as production manager and adviser to Rex Ingram at the Victorine Studios in Nice.[68] These influences tended to be downplayed, the British trade press preferring to cite Hollywood's studios as offering lessons on studio design and planning.[69] In his report, however, Junge was critical of the Warners studios at Burbank for being too spread-out, referring to the complex as a 'great jumble of buildings' with excessive duplication of stores and offices as the number of stages increased, the newer ones being inconveniently located some distance from the central workshop.[70]

Junge considered Pinewood to be closer to the ideal studio than Denham in several respects, particularly its more compact layout and its unit production principle, whereby each unit had its own separate dressing rooms, offices and camera room. Rank realized that to be successful studios had to facilitate several productions at the same time, renting out studio space as well as it being available to units connected with the Rank Organisation. Norton described it as a 'service studio for producers who wish to avail themselves of its unique and ideal conditions and organisation'.[71] As mentioned above, Denham's heavy reliance on films produced by London Film Productions resulted in financial losses, and the studio's design did not so readily accommodate

66 C. A. Lejeune, 'Modern films in the making II – Pinewood', *The Observer*, 7 November 1937, p. 13.

67 *Kinematograph Weekly*, 'Hitch's new lens. An eye for the camera', vol. 245, no. 1580 (1937), p. 32.

68 Raimondo-Souto, *Motion Picture Photography*, p. 169.

69 Editorial, 'Welcome to Pinewood', *Kinematograph Weekly*, Supplement, vol. 236, no. 1537 (1936), p. iii.

70 Junge, *Plan for Film Studios*, pp. 26-8.

71 Norton, 'The functions of Pinewood', p. iii.

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a large number of different units. Norton soon formed Pinebrook, a low-budget film production company intended to fill the studios and which also provided space for resident companies including British and Dominion, Herbert Wilcox, British National and British Paramount. Pinewood's compact layout was a visible manifestation of how its architecture facilitated its longevity, enabling its own narrative as a film studio to persist, deepen and extend to the present day.

Pinewood had five main stages, three of them measuring 110 by 165 foot, with one divided into two smaller stages of 110 by 83 foot, and a fifth stage that was separate from this grouping (figure 12). The total floor space was 72,000 square foot. Two of the large stages had a floor tank that could be flooded or heated as required, a very useful feature that Denham lacked. The three large stages also had a central pit that facilitated working with sets on two levels, and the central position of the property store gave immediate and equal access to all stages. These were constructed on a steel skeleton framework with solid concrete walls and sound-proofed ceilings. Each stage was air-conditioned by rotary fans mounted on the roof, and fog and dust filters were provided. Pinewood had its own power house, but unlike Denham this was more favourably located away from the art department and stages. The cutting rooms were near to the review theatre, providing a further advantage over Denham. The system of covered ways between the workshops and stages enabled quick, easy access between spaces and protection from bad weather.

Pinewood was, despite these benefits, not perfect, since the position of stage five, cut off from the four grouped stages, made it inconvenient for use in conjunction with the others. The carpenter's shop was located alongside one of the big stages, a position that risked the transference of noise and dirt. A final drawback identified by Junge was the proximity of the scene dock and timber store to the road leading out through the site's main entrance, which resulted in undesirable noise from lorries passing the nearby dressing rooms, administrative and club buildings.[72] Like Denham, the workers' canteen and the restaurant were at opposite ends of the complex. Similar 'class-conscious' dining arrangements at Ealing were commented on by production manager and assistant director Erica Masters, when recalling past conditions in studios with cinematographer Sydney Samuelson, who remarked that Pinewood still had two canteens separating staff in 1995.[73] From this perspective, the world-view associated with Heatherden Hall reflected broader social class distinctions. The contrast between the Hall's ornate Victorian architecture and the studio complex's modern, inner fabric may have created tensions within the 'harmonious whole' described above by Norton.

Consultation was at the heart of Junge's research, showing an awareness of studios as living spaces constructed for interaction between workers, able to change and grow according to circumstances. When preparing the report Junge sent a questionnaire to 'many leading personalities and technicians in the film industry', including trade unions,

72 Junge, *Plan for Film Studios*, pp. 24-6.

73 Erica Masters and Sydney Samuelson BECTU interview no. 362, 2 August 1995. British Entertainment History Project. Junge, *Plan for Film Studios*, p. 45.

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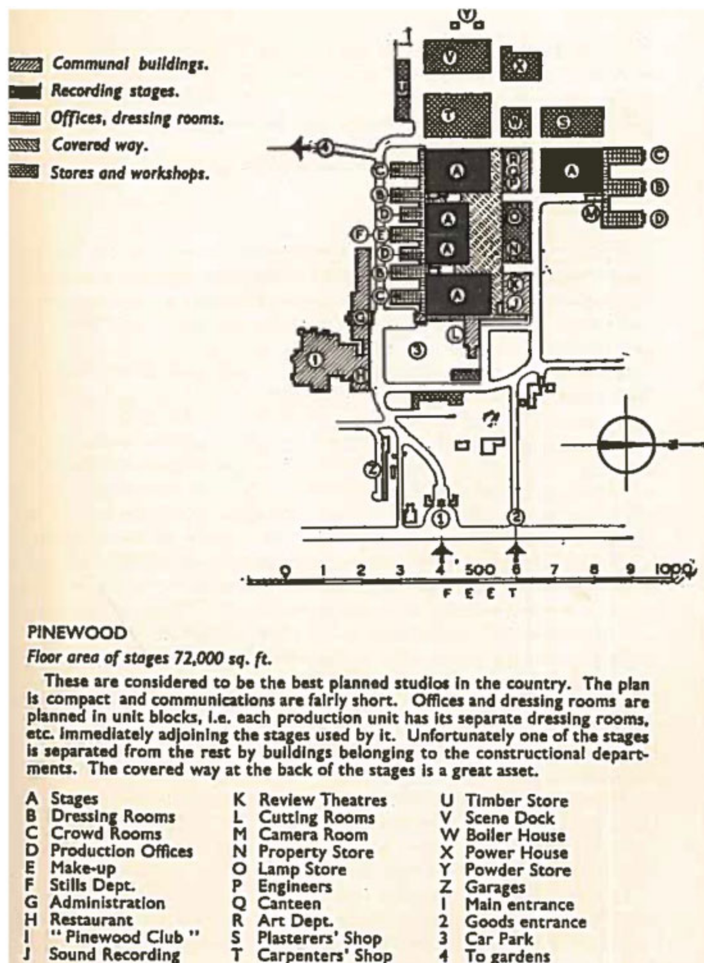

Fig. 12. Helmut Junge's plan for the Pinewood layout, from *Plan for Film Studios* (p. 23).

studio managers, directors, actors, cinematographers and film company board members.[74] Of these, 70% favoured new studios being close to London in the Denham and Pinewood region, with Pinewood considered to be the best available studio because of its compactness, unit blocks and use of covered walkways. Among Hollywood's studios, MGM, Fox and (despite Junge's own reservations) Warners were admired, as was Ufa in Berlin.

Using these examples of good and not so good practice, it seems that the most important considerations for new studios were locating facilities such as camera stores and dressing rooms adjacent to the stages, and keeping noisy workshops further away but with their products still easily accessible via covered walkways. Sound-proofing and controlling the transmission of noise and vibration between stages was a major priority, as was air-conditioning and ventilation to mitigate the heat from arc

74 Ibid., pp. 59–61. Junge's acknowledgements included input from the Association of Cine Technicians, RIBA, Alfred Junge, Paul Rotha, Michael Powell, Richard Norton and Roy Boulting (p. 4).

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lamps and electrical equipment. As these were highly flammable environments, a vital operation was the reduction of studio fire hazards at every opportunity, through the use of steel frameworks, hydrants and sprinklers. Denham and Pinewood were advantaged by their spacious lots, which allowed for expansion and exterior filming, including on the permanently constructed sets of locations such as railway stations and city streets. The stages inside a studio complex needed to be varied in size to facilitate renting studio space for both prestige and lower-budget filmmaking. The ideal design ensured that production 'flowed' seamlessly in a streamlined fashion from pre-planning and production through to post-production. Since Hollywood was often quoted as an ideal environment in terms of the workforce being easily accessible in Los Angeles, when Junge planned his ideal studio complex for Britain, proximity to London was important, and the location of Denham and Pinewood to the west of Uxbridge was decisive in ensuring that some combination of their best features was integral to his innovative 'studio groups' idea. The completion of Western Avenue in 1942, which joined the Oxford Road (A40), further improved access to the area, and an extension to the Underground and electric railways from London was being proposed. Thus Junge's plan was in step with other post-war plans that included faster communication links as integral to their vision for a modernist-inspired future.

What distinguished Junge's planning of the ideal studio complex was its co-operative philosophy, whereby companies could work independently in studio groups of moderate size located on land between Denham and Pinewood, but still share centrally available equipment and facilities. A new road was to be built to connect Denham to the new centre. Elstree was not chosen as an existing site for redevelopment because it was located in the middle of four residential and industrial districts that were designated as locations for post-war expansion of other industries. Each of Junge's groups was divided into unit blocks containing six to twelve stages of various sizes, each with its own lot but with access to a shared space with permanent exterior sets (figure 13). Each group was also to have its own stores and workshops, but a large central workshop was available to all for preparatory construction and building commonly used sets, thereby reducing the amount of work undertaken by the individual studios. Other shared facilities were a central store, laboratories, power station, costume-hire facility, film library, a technical 'research station', offices and a film school. Small groups would cater for specific modes of production such as animation, trick films and documentaries. Junge's ideas for speeding up production time included raising or lowering sections of a stage's floor so sets, camera cranes, lamps etc. could be conveniently stored in close proximity to production activities. Stock, pre-constructed sets would be available to all groups, employing workers in a shared labour pool and permitting the manufacture of commercial articles during slack times. To encourage the production of ambitious, multi-cast musicals, 'special

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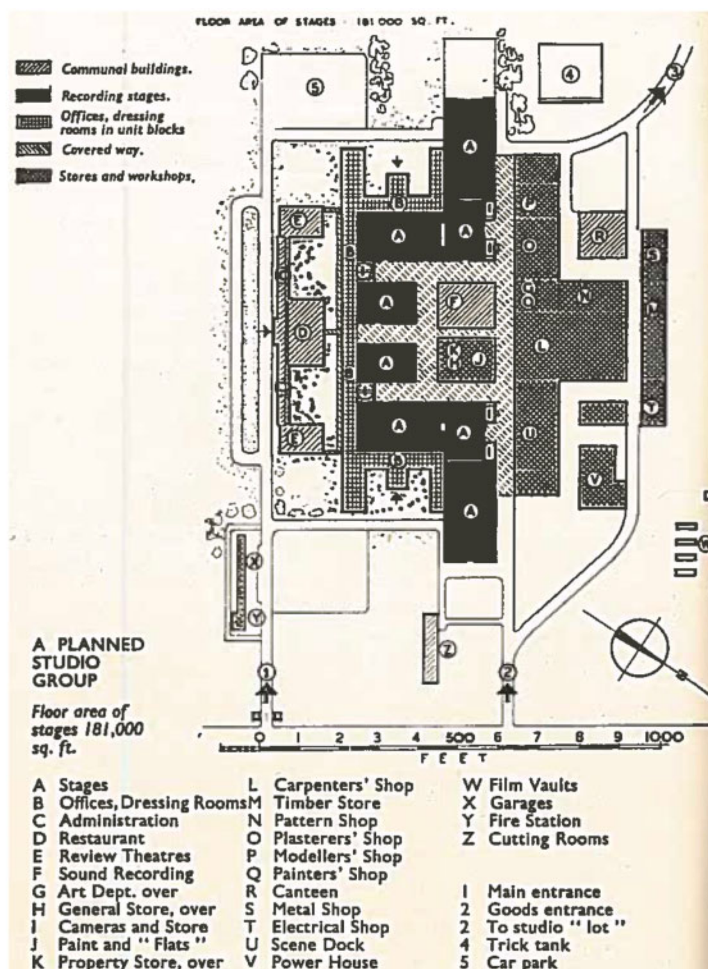

Fig. 13. One of Junge's planned studio groups, from *Plan for Film Studios* (p. 44).

theatre stages' were planned for the largest studios, 'containing permanently constructed theatre sets, including auditorium as well as stages with up-to-date equipment, revolving and rolling stages, traps etc.', as were available in Hollywood.[75]

Perhaps the most radical aspect of the plan was to build a completely new town east of the studio groups. In this respect Junge was inspired by the growing trend for new towns, as well as a desire to root the complex within a region already known for studios. People living in the new town would work in the studios, estimated at a total of 50,000 workers in a town consisting of six separate neighbourhood units, each with just over 8,000 people.[76] The new town was to consist of terraced and detached houses, three- and four-storey flats and hotels, service flats and residential clubs (modelled on the Pinewood Club) for short-term workers. The plans also included theatres, cinemas, restaurants, a

75 Ibid., pp. 37–38.

76 Ibid., pp. 51–52.

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shopping area, schools, a library, a community centre, public gardens and a generous amount of open space; a town with the aspirations of a 'garden city' but dedicated to the film industry. A special zone for film industry business was to be located between the studios and the residential area. Junge hoped that the co-location of studios and a residential film community would be beneficial to the industry, while the relative proximity of London would prevent the type of domination that Los Angeles experienced under Hollywood. This concern influenced Junge's intention for the new housing to be occupied permanently by a majority of working-class technicians and other studio workers rather than 'upper-grade technicians' and film stars, who would more likely live in surrounding towns and villages, or commute from London.[77] While this social aspect of the planning was not further elaborated, it seems that care was taken in proposing diverse housing options, plenty of communal amenities and access to green space.

The studio complex and new town were to be built in stages, and to prevent any single company dominating one or more of the groups, the studios would be run primarily as service facilities, with companies receiving financial support and some degree of regulation from the Government. This latter aspect of Junge's thinking tapped into discussions that were prevalent at the time about nationalizing the film industry. The Association of Cine Technicians was a particularly vociferous trade union in favour of such a move, while the Government remained cautious in its approach to state intervention. In addition, there were concerns that the film industry was unduly monopolized by the two main vertically integrated companies, Rank and the Associated British Picture Corporation. In 1944 it was calculated that between them they owned 70% of available studio space, with Rank alone owning over half at 56%.[78]

Although Junge's plan was clear about the logistical and spatial aspects of planning the studio groups, there was no mention of them having an associated architectural style for their exteriors. This is perhaps surprising, given that his father was known for modernist set designs. There is, however, a connection between Junge's thinking and debates following the war about the need for modernist architecture to develop a 'situated' identity in Britain that kept new architecture in touch with the communities it served.[79] At the end of 1944 the Modern Architectural Research Group staged a major debate about modern architecture, concluding that 'Functionalism' in design should be expanded to include 'a new Architecture of Humanism' that would be 'less dogmatic' and 'recognise the full range of human needs'.[80] This extended to 'Picturesque' planning, which emphasized the importance of access to exterior, landscaped space for healthy living. Junge's new town was planned in this spirit to include plenty of exterior space for its inhabitants, and in the studios he was also keen to collapse barriers

77 Ibid., p. 57.

78 Margaret Dickinson and Sarah Street, *Cinema and State: The Film Industry and the British Government, 1927–84* (London: British Film Institute, 1985), p. 143.

79 William Whyte, 'The Englishness of English architecture: modernism and the making of a national international style, 1927–57', *Journal of British Studies*, vol. 48, no. 2 (2009), pp. 441–65.

80 Nicholas Bullock, *Building the Post-war World: Modern Architecture and Reconstruction in Britain* (London: Routledge, 2002), p. 36.

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between interior and exterior space by means of large sliding doors to enable tracking shots to travel from inside the studio outwards.[81] There was much utopian idealism behind this and other schemes developed in the post-war years. Pinewood could already be seen to include some of these features, as observed by Lejeune on a visit in 1937:

81 Junge, *Plan for Film Studios*, p. 42.

> Where Denham [...] is the Grand hotel of British production, Pinewood is the garden city. Like Welwyn, like Port Sunlight, it is self-supporting. Deprived, by geography, of a life outside it, Pinewood has built up a busy life of its own [...] Outside the gates a new estate is springing up for the workers. Eighty houses are already occupied; new shops are being built.[82]

82 Lejeune, 'Modern films in the making II – Pinewood', p. 13.

Junge's plans were therefore an innovative extension of existing trends and in step with Abercrombie's vision for the decentralization of industry in and around London. They also subscribed to Abercrombie's insistence that each new town had its own character. The impact of the 'Garden City' movement on the design of new towns such as Harlow and Stevenage was, however, later criticized for leaving people 'marooned in a desert of grass verges and concrete'.[83] Unlike Junge's envisaged orientation of the town to the film industry, these emphasized the construction of flats rather than houses, and early plans failed to adequately recognize the importance of social and commercial facilities.

83 J. M. Richards, 'The failure of new towns', qtd in Bullock, *Building the Post-war World*, p. 135.

Junge's omission of a specific architectural style for the new studio groups and town reflected how very different the post-war context was from the 1930s, when Denham and Pinewood were built. The film industry had expanded in the early-to-mid 1930s, and both studios were constructed when confidence was high. Even though the industry experienced a major financial crash in 1937, their status as monumental buildings with 'fantastic functionality' was firmly established. In World War II many studios were requisitioned by the Government and their non-active facilities turned to other purposes, such as one of Denham's large stages being used to store food. As a result of the war, available studio space was reduced to less than half of its pre-war capacity.[84] Government-sponsored films were made by the Service and Crown Film Units at Pinewood and Wembley. When Denham's dubbing and scoring stage was destroyed by incendiary bombs, its rebuilding was permitted so that production could continue throughout the war; most studios, however, had to wait until the end of the war to repair damage caused by air raids and V-bombs. In addition, post-war planning prioritized resupplying equipment and labour and making studios more efficient.[85]

84 Junge, *Plan for Film Studios*, p. 20.

85 W. V. Wolfe, 'Feature film production in Britain', *Journal of the Society of Motion Picture Engineers*, vol. 48, no. 4 (1947), pp. 312–15.

Junge's plan was devised in this context, and the question of how to cut costs, save time and boost production dominated discussions about British studios for many years.[86] Junge's ideal film studios were designed to create more efficient flows between spaces in the complex, but it is debatable whether reducing the time taken to get from one space to another was always a good idea in view of studios' enclosed, 'black box' working environments. Notwithstanding the criticisms of long corridors

86 Sarah Street, 'Pinewood Studios, the independent frame, and innovation', in Jacobson (ed.), *In the Studio*, pp. 203–21.

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referenced earlier, there are also compelling arguments in favour of spacious layouts, such as increasing the opportunity for workers to exercise, to become acquainted with co-workers in other departments as they walked from one section to another, and to enjoy the studio's surrounding locale. The location of the Denham cutting rooms at some distance from the review theatre, for example, would have provided a welcome breath of fresh air and exercise at the end of the day. It seems that an emphasis on well-being in these respects was not consistently uppermost in Junge's plans, although the redesign of Denham and the new studio plan did not locate the cutting rooms beside the review theatre and, as we have seen, the plans for the new town did attend to the inhabitants' social and physical wellbeing. The diagram for one of the new studio groups maintained the physical separation of the restaurant from the 'workmen's canteen', as at Denham and Pinewood.[87] It should be noted, however, that the canteen's proximity to workshops was convenient, especially during periods of intense activity. It is clear that designing the ideal film studio involved several intersecting imperatives: an awareness of tectonic architecture, with its integration of inner substance and outer form; re-working designs of existing studios; and making studios relevant to current planning debates in the context of post-war reconstruction. Evidently there were tensions between the demands of cost-cutting efficiency and the desire to imagine architectural environments as more fully responsive to the well-being of workers.

World War II similarly acted as a spur to forward planning for film studios in a number of other countries. In May 1939 the Fascist government in Italy promoted the 'constitution of an industrial cinematographic zone', and plans were drafted by architect Antonio Valente in 1940 for the largely rural Quadraro area/district surrounding Cinecittà, the LUCE Institute and the Centro Sperimentale to be developed to expand existing film production facilities.[88] To allow for growth the new zone was spacious, with limits placed on any urban development not associated with the film industry. Due to the war, and the regime's subsequent collapse, this scheme was never realized, but the plans highlight the prioritization of film production as well as the principle of a centralized film complex, which resembled Junge's designs for Britain in their inclusion of a film school, housing and amenities for studio workers. Lucien Aguettand, the French set designer who had visited Denham when it was opened, called for new studios to be built at the end of the war that placed the contribution of workers at the heart of their design.[89] Like Junge's plan, Aguettand's ideas were part of a national discussion about post-war planning in 1946, responding as secretary to the CST (Commission Supérieure Technique du Cinéma) to a call by the government to report on the state of the film production infrastructures in France and to make proposals for their improvement and centralization.

This essay has shown how plans of film studios, both existing and unrealized, highlight the material and infrastructural foundations of film

87 Junge, *Plan for Film Studios*, pp. 21, 23, 44.

88 Lucia Cuccu and Lorenzo Cardone (eds), *Antonio Valente. Il cinema e la costruzione dell'artificio* (Pisa: Edizioni ETS, 2005), p. 59.

89 Lucien Aguettand, 'Vers le studio ideal!' (1946), Aguettand 104-B7, Fonds Lucien Aguettand, Bibliothèque du film, Cinémathèque française.

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production. While the Italian, French and British ideal studio complexes were never built, they depended on detailed knowledge of current studio spaces and facilities. Their planning enabled the studios to be examined in detail as architectural structures, initiating new debates about the material base of production. In Junge's case this necessitated conversations with film industry professionals who worked in the studios, which influenced his analyses of floor plans. Although the scheme was intended as part of Abercrombie's *Greater London Plan*, the developing crisis in the film industry in the years after 1945 prevented its realization. The Government's attitude towards state aid for the film industry shied away from directly aiding producers, so it is likely that Junge's ideas about the state's involvement in financing companies and regulating the new studios received little official encouragement. In 1949 the Government opted instead for a policy of indirectly assisting the British film industry with the establishment first of the National Film Finance Corporation and then, in 1950, the British Film Production Fund (the Eady Levy). The ambitions behind Junge's plan were, however, enlightening, suggesting new ways forward that addressed infrastructural issues as well as competition in the film industry, the lack of opportunities for independent producers and unemployment in the studios. The scheme's vision of Denham and Pinewood as 'service facilities' within a larger, co-operative-based complex would have necessitated the sanction of the Rank Organisation, an unlikely outcome in view of the company's monopolistic control over both studios. Instead Rank's response to the production crisis was to introduce new, cost-cutting technologies that in the longer-term benefitted Pinewood, today a global centre for film production, while Denham ceased to operate as a film studio in 1952.[90] In addition to these factors, any major extension to studio facilities involved new regulations as a result of the 1947 Town and County Planning Act which shifted power from landowners to local authorities for redevelopment. Expansion in the immediate post-war context required an industry to be considered essential for the national economy, and while film was considered important it was not the highest priority.

The focus on studio plans, their dimensions, material construction and 'flow' as working spaces has necessitated thinking about them as architectural structures. As we have seen, when extended to film studios ideas concerning 'tectonic expression' are productive in considering their 'narrative capacity' and how they may or may not integrate outer substance and inner forms. This formulation also takes into account a building's relationship to its surroundings, and in the case of British studios this has been fundamentally important. Junge's scheme was part of an on-going evolution of studio activity to the west of Uxbridge, relatively near London. As structures with 'depth-ness', studios had an impact on their locations, and their changing usages over time contributed to their evolving 'narrative capacity'. Denham's current incarnation as the site of luxury apartments is a perfect

90 Street, 'Pinewood Studios, the independent frame, and innovation'.

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example of an emergent usage of the facility, which nevertheless in its marketing draws on the site's residual meaning as a working studio. In this way the studios remain visible, even if in a mythologized, historical context.

The quest for the 'ideal' studio has persisted, as noted by Goldsmith and O'Regan in their study of the hypermobility of feature film production since the turn of the 21st century, identifying how this has 'sparked a global explosion of interest in building and renovating production infrastructure to service and anchor this production to place'.[91] Older studio complexes have been renovated in traditional production locations such as Rome, Berlin, London, New York and Los Angeles, while 'new complexes have been built in traditional centres, as well as in a variety of non-traditional locations, including Vancouver, Bucharest, Cape Town, Wilmington, and Wellington'.[92] In September 2020 the Pinewood Studios Group submitted a planning application for Screen Hub UK, a 750,000 square foot global hub based at Pinewood, comprising an international film-inspired visitor attraction, an expansion of studio production space, and educational and business growth facilities, all located within a green campus. Publicity emphasized that this was 'in accordance with the UK's and Buckinghamshire's strategy for the creative industries and tourism sectors'.[93] Studios and their past reputations remain relevant because contemporary filmmakers seek stable production infrastructures and local environments that reduce the inherent risks involved in film production while opening up global connections. The ideas in Junge's plan equally remain relevant to our understanding of how studios might best function to benefit the film industry, economy and the wider community.

91 Ben Goldsmith and Tom O'Regan, *The Film Studio: Film Production in the Global Economy* (Oxford: Rowman and Littlefield, 2005), p. 1.

92 Ibid.

93 For details see *Pinewood*, <https://pinewoodgroup.com/pinewood-today/news/pinewood-group-submits-planning-application-for-screen-hub-uk/> accessed 10 May 2021.

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