Birmingham Airport's 1939 Terminal and Interwar Air Travel in England

Allan Brodie

South West Region (Partnerships Team), Historic England, Swindon, United Kingdom

Allan Brodie, Senior Investigator, South West Region (Partnerships Team), Historic England, The Engine House, Fire Fly Avenue, Swindon SN2 2EH 07748 920053

Allan.Brodie@HistoricEngland.org.uk Twitter: @allan_brodie54

Allan Brodie is the author of *England's Seaside Resorts* (2007) and *The Seafront* (2018), as well as books on Margate (2007), Weymouth (2008), Blackpool (2014) and Weston-super-Mare (2019). He has also co-written a four-volume history of *Travel and Tourism 1700-1914*, (2014) using sources to illustrate the development of holidaymaking in Britain. This led him to publish *Tourism and the Changing Face of the British Isles* in 2019. He has also written books on England's prisons, the military defences of the Isles of Scilly and a catalogue of medieval stone sculpture in Salisbury Museum.

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The 1939 airport terminal at Birmingham was one of the final acts of interwar aviation architecture and one of the most distinctive. To allow passengers to board or disembark from aircraft, a pair of wings was attached to the side of the building to facilitate so-called 'dry boarding'. This paper will describe the international context for this interesting feature, one which would not be repeated after the Second World War. Interestingly, such obvious referencing to flight in the architecture of airports during the interwar years proves to be surprisingly rare, though examples in other types of building will be discussed. The Birmingham terminal comes at the end of the development of a network of British airports in the 1920s and 1930s, and this programme will also be examined to explain this interesting building's place in it.

Keywords: airport; architecture; Birmingham; Elmdon; flight

Introduction

During the winter of 2017-18, a major water leak damaged the interior of an office building at Birmingham Airport, hardly an event to interest Historic England. However, this was no ordinary office building; this was the original 1939 terminal and therefore prior to any renovation and restoration work taking place, it was considered for designation as a listed building. **Fig 1** This involved detailed research and a site visit by this article's author, a photographer and colleagues from Historic England's listing team. On one of the hottest days of the year in July 2018, at the beginning of a month-long heatwave, Historic England and Birmingham Airport staff donned suits of protective clothing to examine the water-damaged interior.

Externally, the former terminal was still recognisable as the original 1939 building despite some additions, including the distinctive 'glass house' lookout tower

added to the top of the building during the early 1960s. The substantial central block with its striking cantilevered wings, a surprisingly rare feature in an airport building, had survived largely intact. When the modern airport terminal opened nearby in 1984, the original building became offices, and therefore the large public spaces were subdivided, though the original layout could still be easily understood and a number of original features survived, including the stairs. Due to its historical significance and its survival in a recognisable form, it was designated as a Grade II listed building on 20 August 2018.[1]

This paper tells the story of the development of Birmingham's first airport terminal at Elmdon during the 1930s and seeks to explain its context, nationally and internationally, beyond only contemporary aviation buildings. Perhaps surprisingly, this research reveals that such overt and direct allusions to flight in aviation buildings during the interwar period were uncommon. It also explains why winged-designs for airports would not be repeated after Birmingham was constructed.

Interwar British Civil Aviation

In 1919 Jean Dargon discussing the future of aviation wrote that: 'Pre-war aviation was a sport; during the war it was a military weapon; after the war it will be one of the

[1] National Heritage List for England (NHLE) List Entry Number: 1458322. https://historicengland.org.uk/listing/the-list/list-entry/1458322 [accessed 7 August 2020]

transport industries.'[2] The first facilities for flying were simple fields at which air displays took place. In 1909, inspired by a recently held in event at Reims in Champagne, Blackpool decided to hold Britain's first aviation week beginning on Monday 18 October, but dastardly Doncaster hastily arranged an event beginning on the preceding Friday to claim the honour. Blackpool's programme was based on a series of challenges with prizes, but while it was competitive in format, it was celebratory in tone.[3] With the outbreak of war in 1914, the need for dedicated airfields became pressing and large areas of flat farmland were pressed into use through the addition of some modest huts and hangars.

The Department of Civil Aviation (DCA) was created in early 1919, with Frederick Sykes as its first Controller General of Civil Aviation. Of the 337 military airfields in Britain and Ireland in 1918, 13 were reactivated for civil use by late June 1919 and a further 45 sites were the subject of applications for operating licences, including 6 proposed municipal aerodromes. In July 1919 Sykes and the DCA proposed that ten 'key aerodromes' and two 'national aerodromes' would form a civil aerodromes network. This was too expensive for the government, and instead the DCA encouraged

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[2] W. Voigt, 'From the Hippodrome to the Aerodrome, from the Air Station to the Terminal: European Airports, 1909-1945', in ed. by John Zukowsky *Building for Air Travel* (New York: Prestel, 1996), pp. 27-50, p. 31

[3] Voigt, 'Hippodrome to the Aerodrome', p. 27; *Blackpool Aviation Week. October 18th to 23rd, 1909, etc. Official programme-souvenir.* (Manchester: John Heywood, 1909); A. Brodie and M. Whitfield *Blackpool's Seaside Heritage*. (Swindon: English Heritage 2014),p. 84

local authorities to establish their own aerodromes and by 1923 a number were in operation.[4]

These former military airfields became civilian facilities with existing buildings simply being adapted for their new peacetime function and therefore the first terminals were often just simple wooden huts, located with hangars around the periphery of an airfield. On many first-generation airfields, the earliest airline companies were effectively tenants tolerated by the military, and the first airliners were rebuilt or adapted bombers.[5] **Fig 2** Several civil aerodromes, including Croydon and Hendon, soon acquired structures that resembled control towers, but these were not intended to control aircraft operations on the ground or in the air. They merely acted as reporting offices for pilots and offered a good view of the airfield.[6]

The world's first regular international airline passenger service began operating on 25 August 1919 from London (Hounslow Heath) to Paris (Le Bourget), but in March 1920, these operations were transferred to Croydon Aerodrome.[7] This was originally two adjacent landing grounds, Waddon and Wallington, respectively used by the National Aircraft Factory and the Royal Flying Corps.[8] Another important event of 1919 was the formation of Aerofilms Ltd; its oblique collection was sold in 2007 to a

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[4] J. C. Temple and P. Francis, *New Guidelines for Listing Civil Airfield Buildings in England*. (London: English Heritage, 1994), A-1-2

[5] Voigt, 'Hippodrome to the Aerodrome', p. 32

[6] Temple and Francis, *New Guidelines*, B-1-1

[7] H. Pearman, *Airports: a Century of* Architecture. (London: Laurence King Publishing, 2004), p. 45; Temple and Francis, *New Guidelines*, A-1-1

[8] Temple and Francis, *New Guidelines*, B-2-1

partnership of British heritage bodies and has since been digitised. It is now available on the Internet and has proved to be a valuable research tool for this article.[9]

In May 1922 Sykes was succeeded by Sir Sefton Brancker as Controller General of Civil Aviation and in the following year, Brancker announced that Britain's 'future lies in the air, just as our past has come from the sea'.[10] Although he recognised its strategic significance to the country, future development would depend more on local government initiatives and private enterprise, rather than central government direction and investment. By 1923 a small network of regional civil aerodromes was operating, including Alexandra Park at Manchester, Castle Bromwich at Birmingham and Renfrew near Glasgow, but these proved to be short lived ventures.[11] **Fig 3** Brancker was killed when the R101 airship crashed near Beauvais in France on 5 October 1930, during its maiden voyage to India.[12]

Croydon was Britain's principal airport until the Second World War. It was rebuilt in 1927-28 with a completely new airport terminal, which in its day set new standards for airport design and passenger comfort. **Fig 4** It was built of grey artificial stone with the four-storey 50ft (15 m) high control tower located centrally on the top of the aerodrome side of the complex. The new control tower was brought into service in

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[9] https://www.britainfromabove.org.uk/en [accessed 7 August 2020]

[10] P. J. Lyth, 'The Empire's Airway: British Civil Aviation from 1919 to 1939', *Revue belge de philologie et d'histoire,* volume 78, (2000), pp. 865-887, p. 865

[11] Temple and Francis, *New Guidelines*, A-1-3

[12] *ODNB* - http://www.oxforddnb.com/ [accessed 7 August 2020]; *Who was Who online* http://www.ukwhoswho.com/ [accessed 7 August 2020]

April 1928 and the official opening of the building took place on 2 May 1928.[13] Croydon was equipped with one of the first combined passenger terminal/control tower buildings in the world.[14] This was in the same year as the Washington-Hoover airport in America, which had one of the first modern airport terminal buildings in the USA. Its site is now the Pentagon.[15]

However, it seems that developments in aviation in Germany were perhaps a greater influence on the creation of the new terminal at Croydon, and on British interwar airport design in general. In 1922 Hanns Hopp designed Königsberg, the first modern airport in Europe.[16] This was located in East Prussia between Poland and Lithuania, and was physically separated from the rest of Germany, hence the need for the facility. Hopp's terminal unified the splintered, gradual programme of the first Le Bourget at Paris into a single building, with symmetrical terraces on its flat roofs.[17] The first Tempelhof Airport at Berlin, with its terminal of 1926-9 by Paul and Klaus Engler, was also influential on Croydon's form, and subsequent British airport designs.[18] A third significant, early German airport was Hamburg's Fuhlsbüttell, completed in 1929,

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[13] Temple and Francis, *New Guidelines*, B-2-2

[14] A*nnées 30 architecture des aéroports - Airport architecture of the thirties = Flughafenarchitektur des dreissiger jahre.* [Berlin, Tempelhof; Liverpool, Speke, Paris, Le Bourget]. ([N.p.p.]: Éditions du Patrimoine, 2000), p.16

[15] Temple and Francis, *New Guidelines*, A-1-1

[16] Voigt, 'Hippodrome to the Aerodrome', p. 33; Pearman, *Airports*, p. 53

[17] Voigt, 'Hippodrome to the Aerodrome', p. 32; Pearman, *Airports*, p. 53; W. Voigt, 'The birth of the terminal: some typological remarks on early airport architecture in Europe' in ed by Bob Hawkins, Paul Smith and Gabriele Lechner, Historic airports: proceedings of the International l'Europe de l'air conferences on Aviation Architecture: Liverpool (1999), Berlin (2000), Paris (2001) (London: English Heritage, 2005), pp. 11-22, p 14

[18] Voigt, 'Hippodrome to the Aerodrome', p. 34 ; Voigt, 'birth of the terminal', p. 15

by Friedrich Dyrssen and Peter Averhoff. Their building imitated the concave, curved plan of the first Tempelhof Airport and its location between two large hangars at the periphery of the airfield. The control tower was now integrated into the middle of the terminal. However, the most important innovation was within the terminal, as for the first time the airport's various functions were separated into different zones and levels with ramps, stairs, and lifts, both inside and out, moving travellers about.[19]

With hindsight, the new Croydon airport terminal complex can be described as a missed opportunity, but even as it was opening, *The Architect* was giving it a mixed review.[20] John Dower said that 'Croydon is a dull and grim sobriety and does not express aviation at all'.[21] Despite this, Croydon, served as the main civil airport in Britain until the Second World War, and re-opened in November 1944, remaining operational until it finally closed in September 1959.[22]

Sir Sefton Brancker working through the DCA tried to encourage more local authorities to develop civil aerodromes. In October 1928 he supplied information concerning the importance of establishing aerodromes to the town clerks of all British towns with a population greater than 10,000 inhabitants. Within a year, over 30 proposed provincial airport sites were being considered by the Air Ministry and by the end of the decade a national municipal airport campaign was in full swing. Aviation

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[19] Voigt, 'Hippodrome to the Aerodrome', p. 37; Voigt, 'birth of the terminal', p. 15

[20] S. R. Pierce, 'The New Croydon Air Station', *The Architect and Building News.* 119, number 3106, (29 June 1928), pp. 953-60

[21] Voigt, 'Hippodrome to the Aerodrome', p. 41

[22] Temple and Francis, *New Guidelines*, B-2-2

pioneer consultant Sir Alan Cobham played a leading role in this, especially by visiting 110 towns and cities in six months with his 'flying circus'.[23] **Fig 5**

A national conference, 'The Necessity for Municipal Airports', was held in 1929 and was attended by 350 local government delegates. The Royal Institute of British Architects (RIBA) also formed their influential Aerodromes Committee and its secretary John Dower led a highly effective public campaign for aerodromes leading to this committee being adopted by the Air Ministry as its own Aerodromes Advisory Board.[24] During the summer of 1930, Dower visited Germany, Holland and Denmark and published a paper in the *RIBA Journal* in which he captured a snapshot of the latest thinking about the architecture of airports.[25] The Aerodromes Committee also published a report in June 1931 entitled 'Town Planning and Aviation', designed to set the general context and background for the design of civil aerodromes and in the following year they mounted an exhibition of examples, most of which were inevitably at this date foreign.[26]

The campaign to create municipal airports yielded its first fruit in May 1929 when Manchester City Corporation opened the first licenced municipal airport in

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[23] Temple and Francis, *New Guidelines*, A-1-3; https://www.ukwhoswho.com/ [accessed 7 August 2020]

[24] *Années 30 architecture des aéroports*, p. 21; Temple and Francis, *New Guidelines*, A-1-3

[25] J. Dower, 'Some Aerodromes in Germany and Holland', Journal of the Royal Institute of British Architects, volume 38, number 11, (4 April 1931), pp. 351-362

[26] RIBA Library RIBA/ENV 10.13 First interim report of the committee, 'Town Planning & Aviation', March 1931. http://riba.sirsidynix.net.uk/uhtbin/cgisirsi/?ps=pMj5pKgHYc/MAIN_CAT/X/9 [accessed 7 August 2020]

Britain, initially at Wythenshawe before the intended permanent site was completed at Barton in 1930. By the end of the year, Nottingham, Blackpool (Stanley Park) and Kingston-upon-Hull had followed suit, and during the 1930s airports sprang up across the country. The size and cost of new aerodromes ranged from Worcester's £14,000 airport to Liverpool's grandiose £435,500 development, the average cost of an airport scheme being £93,000.[27] **Fig 6** Birmingham would be one of the most expensive, costing finally around £360,000.

The rebuilding of Croydon Airport in 1927-8 included a combined control tower/airport terminal, designed by the Air Ministry, and this became a model for future airport design, the control tower now functioning like the bridge of a ship, with lower flanking blocks.[28] Regional and municipal airports across the country during the 1930s would predominantly follow this example, providing impressive control tower/terminal buildings, though a few airports chose to build separate control towers away from the passenger terminal, including Manchester (Barton) and Weston-super-Mare.[29] The simple watch office was transformed into the nerve centre of the civil airport as Birmingham airport's architect Graham Dawbarn observed in 1937. The Control Officer and his staff became key to airport operations. They were responsible for aircraft marshalling, radio communications, direction-finding equipment, airport lighting and night flying equipment. Designers of airport control towers had to take into account all

[27] Temple and Francis, *New Guidelines*, A-1-4

[28] Voigt, 'Hippodrome to the Aerodrome', p. 40

[29] Temple and Francis, *New Guidelines*, B-1-1

these factors when designing accommodation for this department and inevitably they would enjoy a central location in terminal designs.[30]

This new arrangement of a combined control tower/terminal as first expressed in Britain in the new Croydon Airport terminal of 1928, was followed by Heston to the west of London in 1929, and Portsmouth in 1931, though most examples were constructed during the second half of the 1930s. Examples can be found at Gatwick and Shoreham in 1936, at Ramsgate and Wolverhampton in 1937, at Exeter, Ipswich and Manchester (Ringway) in 1938 and Birmingham and Liverpool in 1939. **Fig 7**

While the initiative was devolved to local authorities, the British government did produce a national plan for airports during the interwar years. The report of the Maybury Committee, published in early 1937, put forward ideas about the regulation and promotion of civil aviation, including the provision of a number of regulated domestic services.[31] The Air Ministry generally appears to have favoured Maybury's conclusions, even including the use of selective subsidies, but the implementation of these new ideas was halted by the start of the Second World War.[32]

The Development of Birmingham Airport

After the First World War, the privately owned Castle Bromwich aerodrome returned to civilian use and provided Birmingham with connections by air to cities including

[30] Temple and Francis, *New Guidelines*, B-1-5

[31] *Flight*, 28 January 1937, p. 95

[32] Temple and Francis, *New Guidelines*, A-1-4, A-1-5

London and Bristol.[33] In 1928, in response to national initiatives to increase Britain's provision of civil aerodromes, Birmingham City Council decided that the city should have its own municipal airport.[34] A memo dated 9 November 1934 outlined the early history of the project, which originated on 7 February 1928 when the General Purposes Committee was instructed by the council to consider the possibility of establishing a municipal aerodrome.[35] By December 1928 discussion was taking place concerning acquiring a site on Stratford Road, though little seems to have happened and instead by June 1931 sites at Aldridge, Elmdon and Shirley were being investigated. A site visit was carried out on 23 June and the committee was impressed with Elmdon.

The Depression, and the subsequent Government cuts in public expenditure, meant that plans had to be shelved. However, by the end of 1933 the scheme had been revived and a new standing committee of the city council, the Airport Committee, was formed in November 1934 to manage the establishment of the airport.[36] One of its first actions was to arrange a visit to a number of European airports thought to be successful designs. A memo dated 7 December 1934 from the City of Birmingham Engineer and Surveyor's Department contains a list of the airports that the committee might wish to inspect. These included Amsterdam, Hamburg, Copenhagen, Berlin, Leipzig and Munich and two secondary groups: group A comprised Zürich, Geneva, Lyon, Paris,

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[33] https://en.wikipedia.org/wiki/Castle_Bromwich_Aerodrome#Creation_to_1937 [accessed 7 August 2020]; K. Wakefield, *Somewhere in the West Country: the history of Bristol (Whitchurch) Airport, 1937-1957* (Wilmslow: Crécy Publishing Ltd, 1997), pp. 48-9, 51-2, 54, 62, 73, 77

[34] Temple and Francis, *New Guidelines*, A-1-3

[35] Birmingham Archives, (hereafter BA), WMCC/AB/1

[36] BA, WMCC/AB/1; B. J. Cheater, *Birmingham Airport: 40th anniversary, 1939-1979*. (Gloucester: British Publishing Company, 1979), p. 16

Brussels and London, while group B featured Nuremberg, Frankfurt, Cologne, Brussels and London. The trip took place in early 1935 and took in the initial, [predominantlyu Germanic group as well as Brussels.[37]

Birmingham's Airport Committee was aware of the specialist nature of airport design; the Aerodromes Advisory Board had by 1935 sanctioned fourteen independent aerodrome consultants who could advise on the flying background or had the expertise to erect buildings.[38] Therefore, at its meeting on 8 January 1935 the clerk to the Airport Committee tabled a letter written to Messrs Norman, Muntz and Dawbarn inviting Mr Norman to attend the committee with a view to them becoming the council's expert advisers. The minutes contain a copy of the reply, signed by Graham Dawbarn in which he discussed their fees and their capabilities. It includes mention of acting on behalf of the Governments of Northern Rhodesia and Palestine, the Maharajah of Jodhpur and some examples closer to home, including the harbour commissioners of Belfast, the States of Jersey and the States of Guernsey, the owners of Heston Airport and Brooklands Aerodrome, and the municipalities of Manchester, Southampton, Hastings and others.

The same meeting resolved to appoint the firm to advise the council about the development of the airport at a fee of £1,500. Later in the minutes, the committee expressed its desire to use a local architect for the construction work and detailed

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[37] BA, WMCC/AB/1

[38] N. Bingham, 'Arrivals and Departures: Civil Airport Architecture in Britain During the Interwar Period' in ed. by Julian Holder and Steven Parissien *The Architecture of British Transport in the Twentieth Century*. Studies in British Art, 13. (New Haven and London: Yale University Press, 2004), pp. 106-132, p. 112

design, but the specialist nature of airport work, and the use of reinforced concrete, led the City Engineer and Surveyor Herbert J Manzoni to recommend experienced firms. He suggested Norman & Dawbarn; Volk & Tiltman who had designed Shoreham and the Leeds/Bradford Airport; and Hoar, Marlow & Lovett, the architects of Gatwick Airport. Manzoni had already been working closely on developing ideas about the form of the airport with Norman and Dawbarn, and prepared a report about this for the Airport Committee in January 1936. Therefore, it is perhaps unsurprising that this was the firm selected to design the airport at Elmdon.

Norman & Dawbarn had an established reputation for airport terminal design. In 1931 Graham Dawbarn (1893-1976) won a bursary to travel around the United States of America to study airport designs. His pilot for this journey of 8,000 miles was Sir Henry Nigel St Valery Norman (1897-1943), known as Nigel Norman.[39] In 1932 Dawbarn wrote a report for the RIBA describing the airports that he saw on his trip.[40] He obviously studied and commented on the key buildings across the USA, but his typescript report also considered the general location of a field, the ground work preparation needed to make a site fit for construction and the overall layout of airports,

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[39] Voigt, 'Hippodrome to the Aerodrome', p. 43. Norman had served in the Royal Engineers during the First World War and had bought his first plane in 1926 and joined the auxiliary in force in the same year. By March 1943 he had been promoted to acting air commodore and died in May 1943 while flying on active service. Who was Who https://www.ukwhoswho.com/ [accessed 7 August 2020] An obituary appeared in Flight 27 May 1943, p. 559.

[40] G. Dawbarn, 'A brief report on the design and construction of civil airports in the United States of America', January 1932: covers layout, runways, hangars, control buildings, terminal buildings, airport hotels and restaurants, etc.' (Royal Institute of British Architects X(079)G 725.39(73), 1932)

including lighting, wind indicators, the siting of the runways, as well as the best locations for hangars and terminals.

Dawbarn, on his return from his fact-finding visit to the USA, immediately designed the new 'Aero Clubhouse' for Brooklands in 1932.[41] In 1933 he formed a partnership with Nigel Norman and briefly with Alan Muntz and carried out airport work at Heston, Wolverhampton, Jersey, Manchester (Ringway) and lastly Birmingham. However, Dawbarn's most famous work postdates the death of his partner in 1943 and was firmly rooted to the ground; he designed the BBC Television Centre in 1949 and this was constructed in 1953-60.[42]

In 1933 Birmingham's council authorised the compulsory purchase of the first 300 acres of land and a year later another 214 acres were similarly acquired. During 1936 a private bill presented by Birmingham Corporation passed through Parliament.[43] It provided for the acquisition of further land and for the diversion of roads and footpaths to allow development to take place. By that time 730 acres had already been acquired.[44] A short article in *Flight* magazine in May 1937 featured a photograph of the site where the new airport was to be built at Elmdon, seven miles from Birmingham city centre. It likened the site to the Western Front because of the uneven character of the

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[41] T. Hutchings and D. Corley, 'Brooklands Aerodrome: The years 1907 to 1939', *Airfield Review*, 107, (July 2005), pp. 58-65, p. 61

[42] https://c20society.org.uk/casework/bbc-television-centre [accessed 7 August 2020]; obituary in *Building*, 13 February 1976, p. 57; obituary in *The Times*, 4 February 1976, p. 16

[43] 'Birmingham Airport' *The Architect and Building News*, (18 August 1939), pp. 187-192, p. 187; 26 Geo 5 & 1 Edw 8 c.cxx

[44] *Flight* 9 February 1939, p. 136

land, which was pitted with several ponds and would therefore require a comprehensive drainage system to be installed.[45] Despite these issues, this was a desirable site because it provided easy access to the city centre, a key factor identified by architects and in the 1937 RIBA exhibition when discussing site selection.[46] The City Engineer and Surveyor, the Public Works Department and Norman & Dawbarn, set to work on ground preparation and drainage, designing the terminal building and hangars, and organising the layout of the airport. Total expenditure on the project, including all the buildings, would amount eventually to around £360,000.[47]

Ground work at Elmdon began during the winter of 1936.[48] On 9 December 1936 a meeting took place at the London offices of Norman & Dawbarn to discuss the development of ideas for the terminal building. By this date the building's distinctive 'wings' seem to have been included in the design:

'With regard to the terminal building, the most notable departure from current practice is the provision of covered loading accommodation by means of hoods on either side of the terminal building, and two covered canopies on the elevation facing

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[45] *Flight,* 27 May 1937, p. 538

[46] *Royal Institute of British Architects, Airports and airways, 1937: catalogue to the exhibition arranged by the Royal Institute of British Architects* (London: Royal Institute of British Architects, 1937), p. 44. A special feature article about aerodromes in the Architects Journal in 1936, made the same point, while bemoaning the distance from Croydon to central London and the similar time-consuming journey from Le Bourget to Paris. C. D. Palmer and C. D. G. Nicholson, 'Information Supplement Nine: Aerodromes' *The Architects Journal,* (16 April 1936), pp. 589-604, p. 592

[47] Cheater, *Birmingham Airport*, p. 16

[48] Cheater, *Birmingham Airport*, p. 19

the landing area. This would provide an overhang of 50 feet over a length of 80 feet on each side, which should be sufficient to enable the loading and emptying of the largest type of passenger aircraft undercover; screens to afford protection on the three open sides of the hoods are proposed.'[49]

By January 1937 Norman & Dawbarn had been authorised to finalise the design drawings, which appear to have been completed by June 1937. At the meeting on 6 October 1937 the Airport Committee resolved to accept the tender of Holst and Co Ltd for the reinforced concrete construction work on the terminal building at a cost of £13,300, which would take 10 months to carry out. On 10 November 1937 the same committee resolved to discontinue itself and instead an ad hoc council subcommittee would be appointed to deal with business as it arose.[50] This is a clear indication that work was well underway and could now be left in the hands of the architects and responsible council officers. However, before signing off, the Airport Committee agreed to accept the tender of Richard Crittall and Co Ltd for the provision of a panel heating system at a cost of £2,690.[51] The committee also resolved to accept the tender of Henry Hall & Son Ltd to supply metal windows and doors at a cost of £1,725 14s.

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[49] BA, WMCC/AB/1

[50] BA, WMCC/AB/1

[51] *Norman and Dawbarn architects and Richard Crittall and Co. Ltd engineers Birmingham Municipal Airport: plans showing details of thermal storage, panel warming and hot water supply installations in terminal buildings and radiator heating in hanger and utility buildings*. BA, LFF 47.42, Newspaper stack, press 25, 11 plans

In 1937, the same year that the influential Maybury report appeared, the RIBA organised an exhibition entitled 'Airports and Airways 1937'.[52] **Fig 8** After opening in London, the exhibition was scheduled to tour Britain, including visiting Birmingham, Derby and Wolverhampton, with Coventry being added to the list subsequently.[53] This was a timely event; by this date a sufficient number of modern airport structures had been created to be beginning to learn lessons from them:

'Early airports were necessarily experiments. Requirements had not been formulated; planning was often non-existent. Fungoid growths of messy buildings appeared in odd and unexpected spots.

The complete airport as now visualised is a complex organism, needing great skill and forethought for its production. It is the function of the architect to plan and to co-ordinate the work of many technical experts. Requirements are gradually becoming more stabilised. As a result, more direct planning is possible, and the standard of design is improving.'[54]

In the section of the catalogue concerning airport buildings, eleven British airports were featured, including Brooklands, Croydon, Ramsgate, Shoreham, Jersey and Gatwick. Also featured were a number of airports within the British Empire, as well

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[52] *Royal Institute of British Architects Catalogue 1937*

[53] *The Architects' Journal*, 24, December 1936, p. 867; *The Midland Daily Telegraph*, 15 November 1937, p. 4

[54] *Royal Institute of British Architects Catalogue 1937*, p. 52

as a substantial section on examples from the USA. France, Italy and Germany, Europe's principal user of aviation.

In this part of the exhibition, item B16 was described as: 'Birmingham Municipal Airport. Model of the scheme for the terminal building.' Intriguingly the entry goes on to say that it had been 'Withdrawn from Exhibition', but no further explanation is provided. This interesting development was noted in the Architects' Journal in July 1937, which suggests that the proposal to construct the airport was postponed due to the appearance of the Maybury Report, hence the withdrawal, but had subsequently been reactivated.[55] This model appears to be one illustrated in contemporary photographs and was said to be held in the airport collection. In the *RIBA Journal* in 1936, there is an article by Graham Dawbarn showing his latest thinking on airport designs, and he began by discussing Birmingham airport, a model of which he illustrated. His scheme at this point involved creating a building wing-shaped in plan, larger, but similar to the airport terminal constructed at Ramsgate in 1937.[56] It differs from the design executed as it was rounded at both ends and apparently larger. It also lacked the distinctive winged canopies flanking the building and being out of date may explain why it was withdrawn.

The beginning of construction work on the terminal occurred in February 1938 and the target date for the opening of Birmingham airport was October 1938; however,

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[55] *The Architects' Journal*, 15 July 1937, p.97

[56] G. Dawbarn, 'Some Aerodrome Buildings', *Journal of the Royal Institute of British Architects*, XLIII, Third Series, (4 April 1936), pp. 582-92, pp. 583-5

it was not until February 1939, that Mr W Faulkner was appointed as its first manager.[57] The airport was ready for traffic on 1 May 1939.[58] From this date, there were regular services provided by Railway Air Services and Southern Airlines to Croydon (with connections on to the continent), the Isle of Man, Belfast, Glasgow, Bristol (with a connection to Dublin), Cardiff, Southampton (for connections to the Channel Islands), Liverpool, Manchester and Shoreham (serving Brighton, Hove and Worthing). From mid-June Western Airlines joined the two companies already operating and added Weston-super-Mare, Swansea, Barnstaple, Newquay and Penzance to the list of destinations.[59] Seaside resorts figured prominently in lists of early airports. In August 1936 *Flight* magazine ran a feature about the new airport at Weston-super-Mare and as a result of an analysis of passenger numbers, the author concluded that 'holiday-makers will use the air while business people still view it with misgiving'.[60]

The terminal at Birmingham was opened officially by HRH the Duchess of Kent on 8 July 1939.[61] **Fig 9** She was joined by the Prime Minister (and local MP) Neville Chamberlain, the Lord Mayor Alderman J Crump and the Airport Committee, led by its chairman, Alderman AH James.[62] *Flight* magazine ran a lengthy feature in July 1939 on

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[57] *The Architects' Journal*. 24 February 1938, p.313: Cheater, p. 21; G. Negus, *Happy landings! a celebration of Birmingham International Airport plc*. (Birmingham, 1989), p. 5

[58] *Evening Despatch*, 1 May 1939, p. 8

[59] Cheater *Birmingham Airport*,, p. 23; *National Air Races Birmingham Airport 29 July-August 1 1949*, p. 11 in British Library 8773 c 13

[60] *Flight*, 20 August 1936, p. 201

[61] *The Times*, 10 July 1939, p. 9

[62] Cheater, *Birmingham Airport*, p. 17; *Flight*, 13 July 1939, p. 38

‘The New Birmingham Airport' on the eve of its official opening.[63] It began with a breathless, paragraph-long sentence singing the new building’s praises:

‘Apart from sheer ingenuity in design, which provides very spacious accommodation in the building which does not outwardly appear to be particularly large, the most interesting feature of the terminal building at Birmingham's Elmdon airport - to be opened next Saturday by HRH the Duchess of Kent - is the way in which facilities for the general public have been offered without interfering with the normal work at the airport.’[64]

Interestingly, it recognised that the new building was something created to be more than functional; it was designed to be an experience for passengers and spectators alike: 'Birmingham Council has decided that flying, and air transport must be "sold", and they have set about the business of encouraging ordinary people to visit the airport and watch what is going on.'[65] Incorporating significant facilities for spectators is a regular theme in airport designs of this period; the first Tempelhof airport in Berlin had seating for 3,000 spectators and in 1929 this was used by 750,000 visitors. Its successor a decade later was planned to have seating for 65,000 spectators on its roof.[66]

In the *Flight* magazine feature, the ‘wings’ flanking the building were not unexpectedly a headline feature of the building:

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[63] *Flight,* 6 July 1939, p. k, l, and 9

[64] *Flight,* 6 July 1939, p. k

[65] *Flight,* 6 July 1939, p. k

[66] Pearman, *Airports,* p. 58

'Briefly, the airport building, which was designed by Norman and Dawbarn, can be described as a four-storey affair, in which provision has been made for covered loading of aeroplanes by the use of balanced cantilever canopies. These canopies, which have a fifty-foot overhang and a clear height above the tarmac of more than thirty feet, have largely determined the design of the building, which has a curious if superficial resemblance to some marine craft - or perhaps to an exceptionally large aircraft, parked on the tarmac, with the control cabin facing the landing area and the tail (which is the main entrance) pointing towards the roadway.'[67] **Fig 10**

The passenger and visitor seem to have been at the heart of the building's design and the article in *Flight* magazine goes on to describe the facilities in the terminal. At the end of the hall, facing passengers as they arrived by car or train was a large mural painting and the entire hall was described as being indirectly lit. In 1939 on the left there were two airline company offices and at the north end of the ground floor was the usual administration offices for the airport. **Fig 11** Apart from the gallery, on the mezzanine floor there was a public bar, tea lounge, restaurant and a balcony from which the whole aerodrome could be seen. Staff were catered for on the ground floor and on the floor above the mezzanine, where there was accommodation including a flat for the terminal's resident steward and stewardess, the various administration offices, the meteorological department and the pilots' restroom. These were reached from the south end of the building by two spiral staircases.

[67] *Flight*, 6 July 1939, p. k-l

The shell of the terminal building and the one hangar that had been built by July 1939, were made of reinforced concrete, with other less substantial structures being constructed in brick. **Fig 12** In due course a second hangar would be erected. The terminal roof was insulated with cork and covered with light-reflecting tiles. The entire terminal building was heated on the panel system by means of an electrical thermal storage plant in the basement. At the entrance gate, a hotel was in the process of being constructed in July 1939, which would have seven bedrooms to meet the initial requirements of airport staff and visiting pilots.[68]

The Architect and Building News on 18 August 1939 ran a five-page feature about the new terminal building, inevitably focusing on the detail of its construction. The building was constructed of reinforced concrete, consisting of a column and beam framework supporting thin panel walls and floors. The external walls were 4½ inches thick, inside which was a 2-inch cavity and a 2-inch thick block lining. The windows had metal frames with metal sills externally and tiled sills internally. Floors and roofs were made of reinforced concrete slabs. The control tower roof was constructed of hollow tiles for the sake of lightness. Internal partitions were either 4-inch hollow block plastered on both sides or glazed wooden screens.[69] Between the terminal and hangar 1 there was a utility block that contained a garage for an ambulance and a fire tender. It also housed a first aid room, electrical substation, airport maintenance department and a canteen with a kitchen.[70]

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[68] *Flight*, 6 July 1939, p. 9

[69] 'Birmingham Airport' 1939, p. 190

[70] 'Birmingham Airport' 1939, p. 191

When war broke out a few weeks after its opening, Birmingham Airport was requisitioned by the Air Ministry and all civil flying ended.[71] During the war, Elmdon was used as an Elementary Flying Training School for the Royal Air Force and Fleet Air Arm and also for flight testing and as a delivery base for Stirling and Lancaster bombers. During the war, the Air Ministry built two hard runways, one 4,260ft long, the other 4,170ft long. The airport reopened for civilian flying on 8 July 1946.[72] A plan dated 18 March 1946 in the Historic England Archive records the layout of the site after its wartime service.[73] **Fig 13**

International Influences on the Terminal's Architecture

The Elmdon terminal reflects strongly the Modern Movement style typified by works as different as Oliver Hill's Midland Hotel at Morecambe and the landmark De La Warr Pavilion at Bexhill by Erich Mendelsohn and Serge Chermayeff, both of which proved to be highly influential in the years before the Second World War. Some elements of Graham Dawbarn's early versions of the Birmingham terminal show obvious links to the hotel in Morecambe, while the finally executed design perhaps owes more to Bexhill.

Modern Movement designs were effective for airports because of their extensive use of glass, concrete and their streamlined, light and airy forms. Mendelsohn had produced a design for an airport in the late 1920s, which is said to have influenced Ernst

[71] Cheater, *Birmingham Airport*, p. 23

[72] Cheater, *Birmingham Airport*, p. 23

[73] Historic England Archive MD95/08405/PA Elmdon Airport Plan – BHM/0742

Sagebiel when designing the second Tempelhof airport at Berlin.[74] He had managed Mendelssohn's practice in Germany before he was forced to emigrate in 1933.[75] A feature in *Flight* magazine in January 1938, entitled 'Airports of To-day', also likened the new central control tower at the rebuilt Le Bourget in Paris (opened 1937) to the emerging airport terminal at Elmdon and both clearly shared the same Modern Movement background.[76]

Another airport that may have had some influence on Norman and Dawbarn's design was at Lyons in France, where a V-shaped terminal building opened in December 1930. In style it closely resembles Birmingham airport, though both may equally share a common ancestry.[77] The terminal buildings of these two airports project inwards from the perimeter, rather than lining part of the edge of the airport, meaning

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[74] Pearman, Airports, p. 45. Erich Mendelssohn was sketching out ideas for airport buildings as early as 1914. Voigt, 'Hippodrome to the Aerodrome', p. 30

[75] M. Hecker, 'Berlin- Tempelhof: a city-airport of the 1930s', in ed by Bob Hawkins, Paul Smith and Gabriele Lechner, *Historic airports: proceedings of the International l'Europe de l'air conferences on Aviation Architecture: Liverpool (1999), Berlin (2000), Paris (2001)* (London: English Heritage, 2005), pp. 92-99, p. 92

[76] *Flight*, 20 January 1938, p. a*;* B. Rignault, 'Paris-Le Bourget: history of an airport site', in ed by Bob Hawkins, Paul Smith and Gabriele Lechner, *Historic airports: proceedings of the International l'Europe de l'air conferences on Aviation Architecture: Liverpool (1999), Berlin (2000), Paris (2001)* (London: English Heritage, 2005), pp. 73-82, pp. 75-6

[77] *Années 30 architecture des aéroports*, pp. 18, 21; B. Toulier, 'Aviation architecture and heritage in France', in ed by Bob Hawkins, Paul Smith and Gabriele Lechner, *Historic airports: proceedings of the International l'Europe de l'air conferences on Aviation Architecture: Liverpool (1999), Berlin (2000), Paris (2001)* (London: English Heritage, 2005), pp. 35-40, p. 37

that they would be less likely to impede future expansion of the area of the site.[78] A similar approach had also been adopted in the design of Helsinki airport in 1937.

The most distinctive feature of the terminal building is its balanced, concrete, cantilever canopies, features designed to allow passengers to embark and disembark under cover. Referred to in contemporary literature as 'dry boarding', this was a key feature of the highly influential, second Tempelhof Airport at Berlin (1936-41), where the front of the terminal building has a long, tall, covered space with a cantilevered roof.[79] A third approach to dry boarding was taken at Gatwick, one which proved to have greater longevity than either the Berlin or Birmingham systems. **Fig 14** Gatwick Airport, which opened officially in June 1936, has a circular terminal building, nicknamed the Beehive, designed by the architects Hoar, Marlow & Lovett.[80] Extending from this were six 20ft-long covered corridors with telescopic canvas canopies radiating out from the central concourse, allowing six aircraft to be handled simultaneously; three corridors were for arrivals and three for departures. In the space where the seventh corridor could have been attached, a subway connected the terminal building to the nearby railway station.[81] Two such corridors were included in the air-side end Birmingham's terminal building.

This form would prove influential, not for airport terminal designs, but for the satellite systems used at major airports from the 1960s onwards, where hubs attached to

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[78] Voigt, 'Hippodrome to the Aerodrome', p. 44

[79] *Flight*, 2 February 1939, p. 90

[80] C. Woodley, *Gatwick Airport: the first 50 years* (Stroud: the History Press, 2014), pp. 16-18

[81] Palmer and Nicholson, 'Information Supplement Nine: Aerodromes', pp. 597-8

the central terminal by enclosed walkway would service planes around them. Examples include the satellites at Newark, New Jersey (1973), Charles de Gaulle in Paris in the 1980s and the 1983 South Terminal at Gatwick.[82]

Although related in principle to Tempelhof II, there may be a more direct model for the winged design at Elmdon. At the height of the depression, the Austin Company of Cleveland, Ohio launched an advertising campaign in *Fortune* magazine. Amongst the 'dream concepts' featured were several airports designed by the architect Robert Smith including a strange airplane-shaped terminal consisting of a long hangar.[83] It was flanked by a pair of cantilevered 'wings' providing shelter, and was attached to a four-storey administration building, passenger hall and control tower.

Surprisingly, overt referencing to flight in the form of airport building was not widely used in 1930s airport design. Neil Bingham in his 2004 article on interwar civil airports thought quite the opposite. Using the thinking of Le Corbusier he wrote that: 'The airport terminal, it was believed, was a building form which was an extension of the flying machine aesthetic that, as Le Corbusier proclaimed, was the exemplification of 'the new machine civilisation'.[84] In Bingham's article he discusses a number of examples, some of which will be acknowledged here, but he also included a range of terminal designs in which the taller central control tower was flanked by wings, in this sense the term simply applying to lower and/or narrower blocks of accommodation. A

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[82] C. J. Blow, *Airport Terminals* (Oxford: Architectural Press, 1996), p. 32

[83] M. Greif, *The Airport Book: from Landing Field to Modern Terminal* (New York: Mayflower Books, 1979), p. 110

[84] Bingham, 'Arrivals and Departures', p. 107

good example is Graham Dawbarn's Jersey Airport of 1937 where the substantial, central cuboidal block containing the control tower is flanked by lower and narrow wings with rounded ends. However, if this is taken as an evocation of flight, then, Sir John Vanbrugh and many Georgian architects could be considered as pioneering aviators for using similar formulas in the design of country houses.

In Britain, the first clear evocation of the theme of flight in terms of planning is Heston Air Park to the west of London, designed by Leslie Magnus Austin (1896-1975).[85] **Fig 15** This is a complex of buildings in the shape of a plane, at least in terms of plan, but it was like no plane on earth in its day. Its form is more reminiscent of a post-war Victor V bomber and was therefore more likely to have been influenced by science fiction, or birds, though there does seem to be a sneaking similarity to depictions of the Egyptian goddess Isis in its form. The individual buildings were decidedly cubic and block like, offering little sense of drifting into the air.

The clearest example of obvious aviation symbolism before Birmingham was in the plan of the now demolished terminal at Ramsgate Municipal Airport of 1937.[86] **Fig 16** It had a unique control tower/terminal that resembled the shape of a contemporary monoplane wing, a form just beginning to be appreciated by the public and made practical by aeronautical engineers. It was the only airport building in Britain designed by David Pleydell-Bouverie.[87] Interestingly, in its plan and form, it resembled a version

[85] Bingham, 'Arrivals and Departures', pp. 112-3

[86] G. Stamp, 'Lost C20 Buildings Ramsgate Aerodrome' *C20 Newsletter* (Spring 2003), pp. 8-9

[87] Temple and Francis, *New Guidelines*, B-2-6

of the scheme for Birmingham airport proposed in 1936 by Graham Dawbarn, before he adopted the winged design.

In 1940 the American architect John Walter Wood (1900-1958) published a book about the design of airports based on his extensive experience.[88] He featured examples from the United States and elsewhere in the Americas, as well as across Europe, including Moscow airport. Only two British airports feature, Croydon and Gatwick with France being represented by five and Germany by six examples. In 51 plates of illustrations the preference for current architectural styles is obvious, most designs being more or less derived from the Modern Movement. What is not obvious, surprisingly, is any overt allusion to flight in the form of the buildings beyond some generalised shaping of predominantly rectilinear wings flanking a central, taller control tower block.

Allusions to flight occur in some non-aviation buildings and a school would seem an unlikely candidate for such symbolism. Nevertheless, Oliver Hill, the architect of the Midland Hotel at Morecambe, produced a design in 1939 for Methley Senior School, Rothwell, that in plan and form would have resembled a contemporary aircraft. Unfortunately, though inevitably, the outbreak of war meant that this eye-catching design was never executed.[89]

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[88] J. W. Wood, *Airports: some elements of design and future development*. (New York: Coward-McCann, 1940); http://dictionaryofarchitectsincanada.org/node/1704 [accessed 7 August 2020]

[89] A. Powers, *Oliver Hill: Architect & Lover of Life 1887-1968.* (London: Mouton Publications, 1989), p. 81; https://www.architecture.com/image-library/ribapix/image-information/poster/unexecuted-design-for-methley-senior-school-

The closest parallel visually to Birmingham's form can be found a long way from Britain; the Fiat Tagliero service station in Asmara in Eritrea was an important structure in the rapid, modernist transformation of the city by the occupying Italians immediately prior to their defeat there in 1941.[90] **Fig 17** Designed by the Italian engineer Giuseppe Pettazzi, it opened in 1938 and flanking its central tower is a pair of 15m long cantilevered, reinforced concrete wings. The design of the petrol station's wings was so audacious that local planners insisted that the canopies should be supported by posts. Dutifully, Pettazzi constructed it incorporating timber posts, but once completed, he simply had them removed.[91] While the similarity to Birmingham is striking, and although Dawbarn had earlier travelled in Africa, due to the military occupation of Eritrea by Italy, he would have struggled to have seen it in the flesh. Therefore, did he know it from the architectural press? Unfortunately, thus far no reference to the garage has been found in any of the contemporary journals that Dawbarn is most likely to have had easy access to. Alternatively, might both Asmara and Birmingham have been influenced by a common source; for instance, Naum Gabo's

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rothwell/posterid/RIBA12631.html [accessed 7 August 2020]; https://www.architecture.com/image-library/ribapix/image-information/poster/unexecuted-design-for-methley-senior-school-rothwell-ground-floor-plan/posterid/RIBA69026.html [accessed 7 August 2020]

[90] It is buildings such as this garage that led to Asmara being designated as a world heritage site in 2017. It features prominently on the UNESCO page of images accompanying the inscription. https://whc.unesco.org/en/list/1550/gallery/ [accessed 7 August 2020]. E. Denison, 'Fiat Tagliero Service Station', *Architectural Design*. (November/December 2006), pp. 134-5

[91] E. Denison, Guang Yu Ren, and N. Gebremedhin, *Asmara: Africa's secret modernist city* (London: Merrell, 2003), p. 15

unexecuted and probably impractical design of 1931 for the Palace of Soviets in Moscow featured extravagant winged blocks flanking a tall, central tower.[92]

Petrol stations closer to home also adopted a variety of structures to allow motorists to fill up their cars undercover. In the 1930s these might range in style from the vernacular to the Modern, with moulded concrete canopies projecting from buildings to cover the pumps. One of the most striking was Henly's Garage of 1937 on the Great West Road at Brentford, where a line of 22 petrol pumps was covered by a curved concrete canopy running down the length of the building.[93] **Fig 18**

Although substantial, this canopy was considerably less ambitious than the wings at Birmingham or Asmara and reflects a wider interest in providing canopies for sheltering customers, such structures being a standard feature in Odeon cinema designs. One of the most dramatic examples is the 1936 Odeon Cinema at Eltham designed by Andrew Mather (1890-1938), where a large, partly circular canopy covers the entrance, and behind there is a glazed stair tower obviously derived from the De La Warr Pavilion at Bexhill.[94] **Fig 19** At Blackpool Pleasure Beach Joseph Emberton employed similar canopies in his updating of the park and its rides in the mid-1930s, such as those

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[92] N. Foster 'Palace of the Soviets competition entry' in S. Matson et al *Naum Gabo - Constructions for Real Life* (London: Tate Gallery, 2020), pp. 53-63; Tate Gallery, *Naum Gabo – Sixty Years of Constructivism* (London: Tate Gallery, 1987), p. 23

[93] K. A. Morrison and J. Minnis, *Carscapes* (New Haven and London Yale University Press, 2012), p. 134-5; J. Minnis, *England's Motoring Heritage from the Air*. (Swindon: English Heritage, 2014), p. 140-1

[94] R. Gray, *Cinemas in Britain: a History of Cinema Architecture* (Farnham: Lund Humphries, 2011), p. 106-7. Some books erroneously date it to 1938, but contemporary newspapers confirm that it was opened in 1936.

adorning the Pleasure Beach Express and the Grand National.[95] **Fig 20** Similar canopies crop up in locations as diverse as Oliver Hill's Prospect Inn in Minster in Thanet, a perilously floating cantilevered canopy above a balcony in the German hospital in Hackney in 1935-6 by Burnet, Tait & Lorne and some of Charles Holden's London underground stations such as at Southgate and Wood Green of 1931-2.[96]

Cantilevered canopies that almost appear to float also feature in some 1930s house designs. Connell, Ward & Lucas provided a canopy over their High and Over house at Amersham in Buckinghamshire in 1928-31 as well as at Temple Gardens at Moor Park in Hertfordshire in 1937.[97] At New Farm (The White House) at Grayswood near Haslemere in Surrey in 1932 they provided a bold, wing-like canopy above the door into the complex.[98] Raymond Myerscough-Walker incorporated a daring semi-circular canopy with only flimsy supports over a sun deck in a 1936-7 house at Chilwell near Nottingham.[99]

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[95] P. Bennett, *A Century of Fun* (Blackpool: Blackpool Pleasure Beach, 1996) , p. 65; V. Toulmin, *Blackpool Pleasure Beach*. (Blackpool: Boco Publishing, 2011), pp. 60-1

[96] A. Powers, *Modern: the Modern Movement in Britain*. (London: Merrell, 2005), pp. 67, 146; E. Karol, *Charles Holden Architect* (Donington: Shaun Tyas, 2007), pp. 356, 357, 361, 367

[97] D. Sharp, *Connell, Ward & Lucas: Modern Movement Architects in England, 1929-1939* (London: Book Art, 1994), pp. 26-7, 50-1; D. Sharp and S. Rendel, *Connell, Ward and Lucas: Modern Movement Architects in England, 1929-1939*. (London: Frances Lincoln, 2008), pp. 44-53, 98-107

[98] Sharp, *Connell, Ward & Lucas*, pp. 30-1; Sharp and Rendel, *Connell, Ward & Lucas*, pp. 66-71

[99] G. Stamp, *Raymond Myerscough-Walker: Architect and Perspectivist* (London: Architectural Association, 1984), pp. 34-5

The ultimate source for apparently floating canopies may be the work of Frank Lloyd Wright; as early as 1894 at the Bagley House, he was using large overhangs and an audacious porch canopy made possible by daring cantilevering.[100] Similar structures were employed in the Frederick C Robie house in Chicago (1906-9) and the Malcolm Willey house in Minneapolis, Minnesota (1933-4).[101] In 1927 or 1928 Wright designed a service station for the corner of Michigan Avenue and Cherry Street in Buffalo, New York, with a large canopy that would have seemed to hover over a car filling up with petrol.[102] It was only finally built in the early 21st century inside the Pierce-Arrow Museum, but this was the type of thinking that Wright advocated in his book *The Disappearing City* in 1932 and followed up in the large scale model of his proposed Broadacre City, which went on display in April 1935.[103]

Audacious concrete canopy designs feature prominently in post-war buildings as diverse as new towns, motorway service stations and the entrance building to Boscombe Pier (1958-62). Nevertheless, Dawbarn's wings at Birmingham Airport far exceed even these for audacity, daring to dispense entirely with supports beneath the wing through the use of elaborate bracing above. **Fig 21**

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[100] T. A. Heinz, *Frank Lloyd Wright* (London: Academy Editions, 1992), pp. 11, 25-7; https://flwright.org/researchexplore/wrightbuildings/frederickbagleyhouse [accessed 7 August 2020]

[101] S. Hart, *Frank Lloyd Wright* (North Dighton: World Publications Group, 1993), pp. 16-17, 58-9; T. A. Heinz, *Frank Lloyd Wright* (Köln: Taschen, 2000), pp. 78-80, 116-7

[102] F. Gutheim, *Frank Lloyd Wright on Architecture: Selected Writings 1894-1940* (New York: Duell, Sloan and Pearce, 1942), p. 293 – dates it to 1928. https://gizmodo.com/a-gas-station-frank-lloyd-wright-designed-87-years-ago-1598706832 [accessed 7 August 2020]; http://www.pierce-arrow.com/frank-lloyd-wright-filling-station [accessed 7 August 2020] suggest 1927.

[103] https://en.wikipedia.org/wiki/Broadacre_City [accessed 7 August 2020]

Conclusion

Each year millions of holidaymakers jet out of Birmingham Airport in search of sun while business travellers dash off for an important meeting. Few, if any, would be aware that their aircraft may be taxiing close to the original 1939 terminal at the south-east corner of the airport. This interesting building was the culmination of a decade of airport construction that saw the creation of a network of around 50 airports in Britain. The vast majority of these sites have either ceased to operate, have succumbed to housing as towns and cities expanded or the airports have grown in size, necessitating the removal of many or all pre-war structures. Among the survivors from the interwar years are the former terminal buildings at Croydon, Gatwick, Shoreham and Liverpool. All of these are architecturally impressive in their own way, but none employ any overt reference to flight in their architecture as occurs at Birmingham with its distinctive wings. However, having said that surprisingly few 1930s airports reflected the form of aircraft, this is perhaps an observation made with the benefit of hindsight. What 1930s airport did not often reflect was the streamlined monoplane characterised by the Spitfire; rather 1930s airport terminal design may have perhaps reflected the more boxlike form of biplanes, the standard aircraft form of the 1910s and 20s. Terminal designs also followed trends in wider architectural design and Birmingham's winged form, while perhaps only once matched anywhere else, can be seen to have a lineage in the various more or less audacious cantilevered canopies used in public buildings and private houses.

Birmingham's terminal lies at the end of an interwar programme of airport construction; when construction and expansion resumed after the war, the world was a different place. Aircraft were larger, faster and operated on longer routes, requiring larger airfields and more substantial terminals. The idea of dry boarding became a fixed element of airport design, but this was achieved through developing the ideas of the Gatwick Beehive with its extendable passages, rather than through providing canopies under which planes might shelter. It is difficult to imagine a terminal with wings capable of sheltering a Boeing 747 Jumbo Jet and therefore it is perhaps no surprise that Graham Dawbarn's innovative design for Birmingham would not be repeated. Thankfully, it has survived through being reused as offices from the 1980s onwards, and while the water leak of 2017-8 caused significant damage, Birmingham Airport and Solihull Metropolitan Borough Council are actively seeking ways to restore and reuse this dramatic building.

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Figures

1 Birmingham Airport terminal, southern elevation. [DP218782] © Historic England Archive

2 A Vickers Vimy Commercial over London Aerodrome, Hendon in 1920, a civilian adaptation of a bomber. [EPW001728] © Historic England Archive.Aerofilms Collection

3 Castle Bromwich Aerodrome and Station in 1922, a First World War airfield converted into a civil aerodrome. [EPW007488] © Historic England Archive.Aerofilms Collection

4 The recently completed Terminal Building at Croydon Aerodrome in 1928. [EPW025099] © Historic England Archive.Aerofilms Collection

5 Sir Alan Cobham, knighted after completing a return flight between Britain and Australia, was at the forefront of promoting flying. [Afl03/36/b0321] © Historic England Archive.Aerofilms Collection

6 A modern image of the 1937-40 terminal of Liverpool Speke Airport, now Liverpool John Lennon Airport. [AA97/03149] © Crown copyright.Historic England Archive

7 Shoreham Airport terminal was designed by R Stavers Hessell Tiltman. [DP054459] © Historic England Archive

8 Pages from the 1937 RIBA Exhibition Airports and Airways. [A Brodie]

9 General view of the terminal at Birmingham airport from the apron. [DP218774] © Historic England Archive

10 View from south showing the distinctive wings of the terminal. [DP218780] © Historic England Archive

11 Ground floor plan of the Birmingham Airport terminal in 1939, redrawn from *The Architect & Building News*, 18 August 1939, 188.

12 Cantilever bracing for the wings attached to the terminal, seen from a second floor window. [DP218802] © Historic England Archive

13 A plan of Birmingham Airport dated 18 March 1946. [MD95/08405] Historic England Archive.

14 The recently completed terminal at Gatwick Airport in 1937. [EPW053258] © Historic England Archive.Aerofilms Collection

15 Heston Airport to the west of London [EPW037338] © Historic England Archive.Aerofilms Collection

16 Ramsgate Airport terminal in 1937. [EPW053975]

17 The Fiat Tagliero Garage in Asmara, Eritrea. [Reproduced courtesy of Sailko, https://commons.wikimedia.org/wiki/File:Fiat_tagliero,_08.JPG]

18 Henly's Petrol Station at Brentford in 1937 [EPR002036] © Historic England Archive.Aerofilms Collection

19 The Odeon Cinema at Eltham taken as it was opening in 1936. [BB87/03080] Historic England Archive.

20| A post-war photograph of Blackpool Pleasure Beach showing the canopies of the Grand National ride [Afl03/lilywhites/blp46] © Historic England Archive.Aerofilms Collection

21 Cantilever bracing for the 'wings' seen from circular second floor window. [DP218803] © Historic England Archive

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