

# Aviation History and Global History: Towards a Research Agenda for the Interwar Period

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By the mid-1930s, over 400,000 kilometers of air routes spanned the globe, transporting an annual total of over 1.2 million passengers; the overwhelming majority of them traveling within Europe and North America. By contrast, the volume of transcontinental air travel was low as the over 100,000 kilometers of transcontinental air routes saw only 5.4 percent of all passengers.<sup>1</sup> The cargo volume of transcontinental air services remained equally low: in 1934, for instance, only 1,200 tons of air cargo were transported, a negligible number compared to the tonnage of the global shipping industry at that time.<sup>2</sup> Accordingly, British politician Bolton Eyres-Monsell, who had first served as First Lord of the Admiralty and later as a member of the British Continental Airways directory board, calculated that it would require 2,000 planes to replace one single steamer between Australia and the British Isles.<sup>3</sup>

In the 1920s and 1930s aviation as a transport technology was still in its infancy. And yet, despite its obvious inferiority compared to transport by ship, it was the promise of connecting metropolises and colonial territories (or in the case of Australia:

<sup>1</sup> Carl Pirath, *Der Weltluftverkehr. Elemente des Aufbaus* (Berlin, 1938), 2.

<sup>2</sup> Carl Pollog, "Der Weltluftverkehr im Jahre 1934/35," *Weltwirtschaftliches Archiv* 44 (1936): 183–213, here 203.

<sup>3</sup> V. Gadow, "Die britische Flotte im Zeitalter der Luft," *Zeitschrift für Politik* 29/5 (1939): 365–367, here 365.

<sup>4</sup> Daniel Headrick, *The Tools of Empire. Technology and European Imperialism in the Nineteenth Century* (New York/Oxford, 1981).

<sup>5</sup> See, Peter Ewer, "A Gentlemen's Club in the Clouds. Reassessing the Empire Air Mail Scheme, 1933–1939," *Journal of Transport History* 28/1 (2007): 75–92.

<sup>6</sup> See, for instance, Sacha Markovic, "Le rôle de l'Etat dans la naissance de l'aviation commerciale française (1918–1933)," *Revue belge de philologie et d'histoire* 78/3 (2000): 969–991; Marc Dierikx, *Blue in the Sky. KLM Royal Dutch Airlines, 1919–1999* (The Hague, 2000); Marc Dierikx, "Routes Versus Revenues. Pioneering Commercial Aviation in Holland 1919–1940," *Revue belge de philologie et d'histoire* 78/3 (2000): 889–911; Guy Vanthemsche, *La Sabena. L'aviation commerciale belge, 1923–2001* (Brussels, 2002); Federico Caprotti, "Visuality, Hybridity, and Colonialism. Imagining Ethiopia Through Colonial Aviation, 1935–1940," *Annals of the Association of American Geographers* 101/2 (2011): 380–403; Lutz Budrass, *Adler und Kranich. Die Lufthansa und ihre Geschichte* (Munich, 2016).

a dominion) across continents that made long-range flying appear as a future "tool of empire" (Daniel Headrick) in the interwar years.<sup>4</sup> Beginning immediately after the First World War, different empires fostered the development of air transport in order to facilitate communication with their far-flung colonies and dominions.

State-sponsored airlines, so-called "flag carriers," existed in all Western states with major imperial ambitions. The Dutch KLM, for instance, was founded as early as 1919 and pioneered civil aviation to Southeast Asia. The British government initiated the establishment of the commercial airline Imperial Airways in 1924. Its incorporation into the heavily subsidized "Empire Air Mail Scheme," according to which all "first class" mail within the empire was to be shipped by air, greatly expanded the airline's financial means.<sup>5</sup> By the late 1930s, the company operated air links from London to Southern Africa, the Persian Gulf, India, and Australia. The Belgian airline Sabena operated routes within the Belgian Congo from 1925 on and opened a Europe–Africa service a decade later. The planes of different French airlines, some of them merged into Air France in 1933, regularly touched down in Saigon, Antananarivo, Casablanca, and Dakar. From there, they also crossed the South Atlantic, flying to Rio de Janeiro and Buenos Aires. South America was also among the destinations of Pan American Airways flights, the United States' flag carrier, whose network reached across the Pacific region and the Atlantic with the first air link to Europe opened in 1939. Besides these airlines, a plethora of companies with only regional significance as well as airlines originating from non-imperial states or would-be empires (such as Germany's Luft Hansa) ploughed the skies.

Academic writing since the 1960s has explored the histories of these different airlines and their world-spanning networks in some detail.<sup>6</sup> Especially the flagship airlines of Great Britain and the United States have received particular attention

in the historiography. Marylin Bender and Selig Altschul were the first to provide a comprehensive history of Pan American Airways, written for a general audience. Their notion of the airline as the United States' "chosen instrument" was later questioned by Erik Benson, whose research has suggested that Pan American Airways often followed its own business interest rather than state directives.<sup>7</sup> Still, as Jenifer van Vleck's meticulously researched study *Empire of the Air* (2013) has demonstrated, commercial aviation did indeed play an important role in establishing and maintaining U.S. hegemony in the Western Hemisphere.<sup>8</sup>

Regarding British imperial aviation, Robin Higham, in the 1960s, and Robert McCormack, in the 1970s, were the first to study the history of British overseas airlines.<sup>9</sup> Gordon Pirie's various contributions to the field, in particular his seminal study *Air Empire* (2009), have carried this research further.<sup>10</sup> Pirie traces the social history of civil aviation in the British empire, studying the development of imperial air routes and passenger movements as well as the construction of ground facilities and the representation of flying in imperial discourse. Chandra Bhimull's book *Empire in the Air* (2017) likewise studies British imperial aviation. Focusing on the Caribbean, she explores how "airline travel reshaped the composition and experiences of empire"<sup>11</sup> and draws our attention to notions of race and racial hierarchies in early airline travel.

While aviation infrastructure in the interwar years has thus been the subject of a number of studies, there is one shortcoming common to most of the existing literature: in almost all of the above-mentioned studies the transcontinental networks of different airlines appear as detached from one another. Because the authors usually cover one single national airline in their writing, most explore the formation of long-distance air routes in a national framework, often treating interactions or commonalities with other airlines as a side

<sup>7</sup> Marylin Bender and Selig Altschul, *The Chosen Instrument. Pan Am, Juan Trippe, the Rise and Fall of an American Entrepreneur* (New York, 1982); Erik Benson, "The Chosen Instrument? Reconsidering the Early Relationship between Pan American Airways and the U.S. Government," *Essays in Economic and Business History* 22 (2004): 97–110.

<sup>8</sup> Jenifer van Vleck, *Empire of the Air. Aviation and the American Ascendancy* (Cambridge, MA, 2013).

<sup>9</sup> Robin Higham, *Britain's Imperial Air Routes, 1918–1939. The Story of Britain's Overseas Airlines* (Hamden, CT, 1961); Robert McCormack, "Airlines and Empires. Great Britain and the 'Scramble for Africa,' 1919–1939," *Canadian Journal of African Studies* 10/1 (1976): 87–105.

<sup>10</sup> Gordon Pirie, "Passenger Traffic in the 1930s on British Imperial Air Routes. Refinement and Revision," *Journal of Transport History* 25/1 (2004): 63–83; Gordon Pirie, *Air Empire. British Imperial Civil Aviation, 1919–39* (Manchester, 2009).

<sup>11</sup> Chandra D. Bhimull, *Empire in the Air. Airline Travel and the African Diaspora* (New York, 2017).

**12** This is not to say that these studies are entirely ignorant of the existence of other carriers. Pirie, for instance, points to the role of KLM as a competitor of Imperial Airways, while Bhimull's book touches upon the joint operations of Imperial Airways and Pan American Airways in the Caribbean.

**13** Marc Dierikx, "Struggle for Prominence. Clashing Dutch and British Interests on the Colonial Air Routes, 1918–42," *Journal of Contemporary History* 26/2 (1991): 333–351. For competition in the field of law making, see also Alan P. Dobson, *Peaceful Air Warfare. The United States, Britain, and the Politics of International Aviation* (Oxford, 1991).

**14** As an introduction to the themes and methods of global history, see Sebastian Conrad, *What is Global History?* (Princeton, NJ, 2016); and Roland Wenzlhuemer, *Globalgeschichte schreiben. Eine Einführung in 6 Episoden* (Konstanz, 2017).

**15** Conrad, *Global History*, 11.

**16** *Ibid.*, 4.

note.<sup>12</sup> Marc Dierikx, to name one exception, has illuminated the importance of competition between Imperial Airways and the Dutch KLM in the development of the air routes to Asia.<sup>13</sup> But apart from his work, no study has investigated the many fields of cooperation and coordinated planning, or the potential conflicts, between the airlines and authorities of different empires and nation states. And so far, no author has investigated the entangled history of multiple imperial airlines systematically.

In this article, I am proposing a research agenda for a global history of interwar aviation. Since the early 2000s, global history has emerged as a research perspective for studying historical phenomena and processes in their global interaction (rather than in isolation) and against a global background.<sup>14</sup> Being, as Sebastian Conrad contends, "a heuristic device that allows the historian to pose questions and generate answers that are different from those created by other approaches,"<sup>15</sup> global history provides a lens through which we can study different eras and geographical contexts. This lens helps explore processes of exchange, transfer, and interaction between and across world regions. Most importantly, global history writing decenters and overcomes what Conrad calls "the two unfortunate birthmarks of the modern disciplines,"<sup>16</sup> meaning Eurocentrism and the nation-state as an analytical container.

A global history of imperial aviation thus ventures beyond national frameworks and engages hitherto neglected questions of similarities, entanglements, and transfers in the formation of global transport infrastructure systems. The aim of the present article is to develop a set of questions and to identify research foci for conducting such a comprehensive historical analysis. Ultimately seeking to demonstrate that the development of transcontinental air routes from the 1920s to the early 1940s did not merely run parallel but was a shared project of different imperial formations, I will outline three potential avenues of studying aviation history as global history.

Following an overview of the historical context in which the airplane emerged as an imperial technology in the wake of

the First World War, I will discuss three central aspects of my research project: first, a transimperial approach that will facilitate an understanding of how empires and their actors engaged with one another; second, a multilayered approach to aviation history that emphasizes the micro-analytical level; and finally, the question of global connectedness. In line with recent trends in global history writing, I propose to address this question by simultaneously looking at both connections and their absence. My concluding thoughts will draw together the article's key arguments.

## I. The global context

After the First World War, Europe's empires were trapped in what historian Robert Gerwarth has called an "imperial paradox": they were at the same time expanding and in a state of dissolution.<sup>17</sup> Britain and France reached the greatest physical extent in consequence of the war, when the League of Nations mandated them rule over the former German and Ottoman colonies.<sup>18</sup> Other imperial powers, too, expanded their spheres of influence. According to Christopher Bayly, the Japanese attack on China (1937) as much as Italy's war against Ethiopia (1935–7) and Germany's expansionist ambitions in Eastern Europe all bear testimony to what he calls the "Third Age of Imperialism," the expansion of imperial formations in the 1920s and 1930s.<sup>19</sup> In addition, President Franklin Roosevelt's "Good Neighbor policy" towards Central and South American countries heralded the U.S. "market empire" (Victoria de Grazia) in the Americas. By the eve of the Second World War, the United States' formal empire comprised 13 inhabited overseas territories with a total population of almost 19 million people.<sup>20</sup>

Imperial history in the interwar years was, however, also "une histoire d'un divorce" (Jacques Marseille), as anticolonial agitation and revolts in many colonies threatened Europe's established empires.<sup>21</sup> British rule faced opposition in Ireland, Palestine, Iraq, Afghanistan, India, and

**17** Robert Gerwarth, "1918 and the End of Europe's Land Empires," in *The Oxford Handbook of the Ends of Empire*, ed. Martin Thomas and Andrew S. Thompson (Oxford, 2017), 27–42.

**18** Martin Thomas, *The French Empire between the Wars. Imperialism, Politics and Society* (Manchester, 2007), 1; Sarah Stockwell, "Britain and Decolonization in an Era of Global Change," in *The Oxford Handbook of the Ends of Empire*, ed. Martin Thomas and Andrew S. Thompson (Oxford, 2017), 65–84, here 67.

**19** C.A. Bayly: *Remaking the Modern World 1900–2015. Global Connections and Comparisons* (Hoboken, NJ, 2018), 95.

**20** A.G. Hopkins, *American Empire. A Global History* (Princeton, NJ, 2018), 15. See also Paul A. Kramer, "Power and Connection. Imperial Histories of the United States in the World," *American Historical Review* 116/5 (2011): 1348–1391; Victoria de Grazia, *Irresistible Empire. America's Advance through Twentieth-Century Europe* (Cambridge, MA, 2006).

**21** Jacques Marseille, *Empire colonial et capitalisme français. Histoire d'un divorce* (Paris, 2005).

**22** Robert Gerwarth and James E. Kitchen, James E. (2015): "Transnational Approaches to the 'Crisis of Empire' after 1918: Introduction," *Journal of Modern European History* 13/2 (2015): 173–182, here 174.

**23** Sarah Stockwell, "Britain and Decolonization;" Frederick Cooper, "Decolonization in Tropical Africa," in *The Oxford Handbook of the Ends of Empire*, ed. Martin Thomas and Andrew S. Thompson (Oxford, 2017), 317–332, here 318.

**24** Gerwarth and Kitchen, "Transnational Approaches," 174; Thomas, *French Empire*, 211; Hopkins, *American Empire*, 537.

**25** Thomas, *French Empire*, 1.

**26** Eda Kranakis, "European Civil Aviation in an Era of Hegemonic Nationalism: Infrastructure, Air Mobility, and European Identity Formation, 1919–1933," in *Materializing Europe: Transnational Infrastructures and the Project of Europe*, ed. Alexander Badenoch and Andreas Fickers (Basingstoke, 2010), 290–326, here 293.

**27** Dierikx, "Struggle," 333.

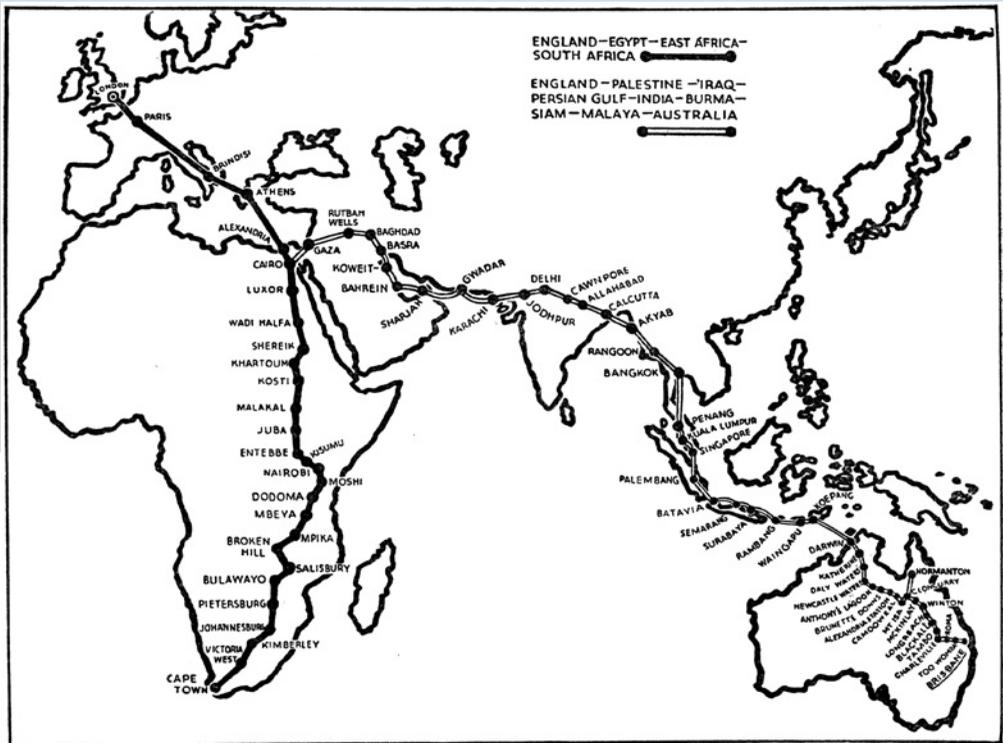
Burma.<sup>22</sup> The empire acknowledged Egyptian independence in 1922 after three years of revolutionary struggle, although Britain retained the de-facto power afterwards. Waves of strikes and urban riots in the 1930s further unsettled the British empire in the West Indies and Eastern Africa.<sup>23</sup> At the same time, the French faced revolts in Algeria, Syria, Vietnam, Morocco, and French Equatorial Africa, while the United States saw themselves confronted with anticolonial movements in Hawai'i and Puerto Rico and had to grant the Philippines, Cuba, Haiti, and Panama greater political independence.<sup>24</sup> At the zenith of their territorial expansion empires were losing their grip on their overseas possessions.<sup>25</sup>

It was in this situation that aircraft technology came of age. While colonial armies made use of the new technology in suppressing unrest — the British used aerial bombing for the first time in 1919/20 in Somaliland — commercial aviation, too, was expected to serve the empires' interests.<sup>26</sup> Different governments established or appointed commercial airlines as flag carriers and subsidized their operations, either through direct investment or through air mail contracts and remuneration for the transportation of mail.<sup>27</sup>

Air routes were expected to bring colonies and European capitals closer together, thus reinforcing the empires' grip on their overseas possessions.<sup>28</sup> In 1933, Imperial Airways general manager Harold Burchall described this function for the British empire, arguing that "air transport is essentially the vehicle of Management. It is the business letters, the State documents, the Government officials and the men of high standing in the commercial world who are best served by the aeroplane, which enables so great an increase of work to be done in a given time."<sup>29</sup> According to the journalist and

**28** Teresa Crompton, *British Imperial Policy and the Indian Air Route, 1918–1932*, PhD thesis, Sheffield Hallam University, 2014, 28.

**29** Harold Burchall, "Air Services in Africa," *Journal of the Royal African Society* 32 (1933), 55–73, here 56.



conservative politician Harry Brittain, Imperial Airways' long-distance air routes not only helped sustain British rule, but also reinforced connections within the imperial sphere and thus strengthened the colonial settlers' allegiance to the motherland. "At Khartoum, in the Sudan," he wrote, "Britishers are now in rapid communication with London. In the Grand Hotel which looks upon the Nile, English exiles may read their newspapers and the activities of London life within a few days of their happening. [...] Uganda and Tanganyika, with their white settlements once isolated by many weeks from London, are now brought within a few days of the Empire's capital."<sup>30</sup>

Aircraft possessed the ability to link not only metropolises to colonies but also colonial territories among themselves as hitherto inaccessible places could now be connected with major settlements, which were often located along coastlines.<sup>31</sup> Regarding French aviation in the colony of Indochina (comprising today's Laos, Cambodia, as well as parts of China and Vietnam), an article in 1930 stressed the importance of this process, explaining that "the objectives of our aeronautic program in Indochina are in accordance with our wider political agenda: the strengthening of peace and security; the establishment of rapid

Figure 1. Imperial Airways air routes. Source: Harry Brittain, *Wings of Speed* (Hutchinson, 1934).

<sup>30</sup> Harry Brittain, *Wings of Speed* (London, 1934), 95.

<sup>31</sup> Kranakis, "European Civil Aviation," 297.

**32** Pierre Cordemoy, "L'Indochine et l'aéronautique," *Bulletin de l'Agence Economique de l'Indochine* 3/26 (1930), 37–45, here 37. All translations are my own. See also Gregory C. Seltzer, *The Hopes and the Realities of Aviation in French Indochina, 1919–1940*, PhD thesis, University of Kentucky, 2017, 1.

**33** McCormack, "Airlines," 88. For the notion of "tyranny of distance," see Geoffrey Blainey, *The Tyranny of Distance: How Distance Shaped Australia's History* (Melbourne, 1967).

**34** van Vleck, *Empire*, 6.

**35** "Reason for Optimism," *Pan American Airways Africa News Letter* 1/16 (1942): 1.

and regular postal communication; the extension of French influence to the inside and the outside of the colony."<sup>32</sup> In both major European empires, the French and the British, the promise of aviation infrastructure was to maintain and strengthen intra-imperial ties by bridging the "tyranny of distance" (Geoffrey Blainey) with hitherto unheard-of speed.<sup>33</sup>

While the role that imperial planners and lobbyists in the French and British empires envisaged for aviation seems predictable, the case of Pan American Airways in the U.S. empire requires further explanation. The airline was founded in 1927 at the instigation of the U.S. government and, with the aid of the state, built an extensive network in the Americas and the Pacific region. By 1937, ten years into its existence, it could claim to operate over 50,000 miles of air routes. Pan American Airways blatantly exhibited all features of an imperial airline. Not only was it founded with the aim of ensuring the hemispheric dominance of the United States in the American skies, but it also functioned as an air link between the continental United States, its formal colonial possessions in the Pacific, and the Philippines. More than that, the airline also promoted the informal U.S. empire and its economy abroad, thus "creating an ostensibly extraterritorial 'empire of the air,' [through which] the airplane appeared to offer the United States an empire without imperialism — an empire for the American Century, based on markets rather than colonies, commerce rather than conquest,"<sup>34</sup> as van Vleck observes.

Pan American Airways was not shy in displaying these imperial roots. When the airline established its transatlantic air route to Liberia, for instance, its officials described this feat in typical colonial language and stressed the American contribution in the long-running inter-imperial project of African colonization: "For centuries Europeans have apparently had the controlling hand in Africa. Actually, Africa has always been the winner. [...] But our men were different [...]. They took Africa by the corners and shook it into shape — adjusted it to themselves."<sup>35</sup> The air route across the northern Atlan-



**Figure 2.** “Fly to South Sea isles via Pan American” (1938). Library of Congress Prints and Photographs Division.

tic, first inaugurated in 1939 between the U.S. and France and shifted to West Africa during the war, filled one of the last blank spaces on the map of international aviation.<sup>36</sup> By the early 1940s, the networks of European and American imperial airlines had circled the entire globe.<sup>37</sup> In the following section, we will take a closer look at these global infrastructure networks and provide an overview of the entangled patterns of connectivity, cooperation, and competition in their formation and operation.

<sup>36</sup> Deborah Wing Ray, “The Takoradi Route. Roosevelt’s Prewar Venture beyond the Western Hemisphere,” *Journal of American History* 62:2 (1975), 340–358; Gordon Pirie, “Winging it across the Atlantic. Pan Am and Africa, 1940–1990,” *Journal of Transatlantic Studies* 19 (2021), 72–98.

<sup>37</sup> van Vleck, *Empire*, 140.

**38** See Ann Laura Stoler and Frederick Cooper, "Between Metropole and Colony. Rethinking a Research Agenda," in *Tensions of Empire. Colonial Cultures in a Bourgeois World*, ed. idem (Oakland, CA, 1997), 1–56; David Lambert and Alan Lester, "Introduction. Imperial Spaces, Imperial Subjects," in *Colonial Lives Across the British Empire. Imperial Careering in the Long Nineteenth Century*, ed. idem (Cambridge, 2006), 1–31.

**39** Daniel Hedinger and Nadin Heé, "Transimperial History. Connectivity, Cooperation and Competition," *Journal of Modern European History* 16/4 (2018): 429–452, here 429.

**40** *Ibid.*, 433.

**41** *Ibid.*, 430.

## II. Connectivity, cooperation, and competition

In the historiography of imperialism, it has often been argued that metropole and colony should be understood as one interconnected imperial sphere, across which people, ideas, or commodities traveled. Placing colonies and imperial centers within the same analytical framework, a great number of studies since the 1990s have traced these flows within the spheres of different empires.<sup>38</sup> Connections between and across different empires as well as actors and practices transcending them, by contrast, have not been investigated in much detail; as Daniel Hedinger and Nadin Heé have observed in a recent essay, "[t]he paradoxical effect [of this neglect] has been that empires have often ended up being nationalized."<sup>39</sup> Existing literature on interwar aviation confirms this observation: almost all studies remain within the analytical framework of one single empire and its respective airline.

Addressing what they perceive as the shortcomings of "nationalized" imperial history writing, Hedinger and Heé propose a new framework for researching what they call the "transimperial" history of modern empires. Historians, they contend, should bring different empires into the same analytical field. Understanding imperialism as a shared project in which "empires had similar 'politics of comparison' in common, be it to cooperate with or combat against one [an]other,"<sup>40</sup> they suggest three "C's" along which a study of different empires' mutual engagement could proceed: connectivity, cooperation, and competition.<sup>41</sup> Adopting this approach, in this section I explore potential avenues for researching the transimperial history of air networks in the interwar period and investigate how imperial formations, their flagship airlines, and aviation experts interacted with one another as well as with other states and their airlines and experts.

Connectivity, to begin with, is found in scientific and technological networks across national and continental boundaries. The development of aircraft technology took place in

a transimperial sphere, although the invention and production of aircraft appear very nationalized at first. Paying heavy subsidies for the operation of air routes, different governments — for instance in Britain or Germany — expected their major airlines to use only nationally produced aircraft, thus supporting domestic manufacturers. Imperial Airways, for instance, was bound to Hertfordshire-based Handley Page and exclusively used its HP42 aircraft on the empire routes before the airline switched to flying boats produced in Rochester.<sup>42</sup> Aircraft manufacturing, however, was never a purely national affair. Components developed abroad were often produced by local licensees. BMW, for instance, produced Pratt & Whitney engines, developed in the United States, for the German Luft Hansa fleet.<sup>43</sup>

Moreover, the development of heavier-than-air aircraft in different countries did not just run parallel but was an entangled process, marked by knowledge exchange and technology transfers. Beyond the narrative of aeronautical development as a history of national pioneers, research taking account of shared innovations has the potential to illuminate the scientific communities and transnational networks involved in producing and transforming aviation knowledge. To make the flows of practices, knowledge, and its producers across different empires and continents visible, this research has to follow the circulation of specific objects and innovations, such as the all-metal frame, which was originally introduced by German manufacturer Hugo Junkers in 1919 and soon became the international standard after the Junkers F 13 plane met with huge success.<sup>44</sup> Over a decade later, to give another example, manufacturers in all major aircraft-producing countries began to develop flying boats, airplanes with a boat hull that allows them to land on water.

A cursory examination of aerodynamic research from the turn of the century to the 1930s illustrates how knowledge circulated on a global scale. The question of “streamlining,” meaning the reduction of drag on aircraft by optimizing its

<sup>42</sup> Kranakis, “European Civil Aviation,” 318.

<sup>43</sup> Budrass, *Adler und Kranich*, 250, 306.

<sup>44</sup> Stefan Rinke, “Die Firma Junkers auf dem lateinamerikanischen Markt, 1919–1926,” in *Grenzenlose Märkte? Die deutsch-lateinamerikanischen Wirtschaftsbeziehungen vom Zeitalter des Imperialismus bis zur Weltwirtschaftskrise*, ed. Boris Barth and Jochen Meissner (Münster, 1995), 157–184. See also Eric Schatzberg, *Wings of Wood, Wings of Metal. Culture and technical choice in American airplane materials, 1914–1945* (Princeton, NJ, 1999), 40–42.

45 John Anderson, *A History of Aerodynamics and its Impact on Flying Machines* (Cambridge, 1997), 310.

46 *Ibid.*, 342,

47 Akira Iriye, *Global Community. The Role of International Organizations in the Making of the Contemporary World* (Oakland, CA, 2004), 22.

48 Kranakis, "European Civil Aviation," 295.

49 "Convention Relating to the Regulation of Aerial Navigation," Paris, October 13, 1919, printed in *Journal of Air Law and Commerce* 1/1 (1930): 94–104, here 94.

shape, connected scholars on different continents. The first wind tunnel was developed in 1908 by Ludwig Prandtl in Göttingen. In 1920, his disciple Max Munk moved from Germany to the United States to work for the National Advisory Committee for Aeronautics (NACA). Munk and his colleagues at NACA studied the characteristics of over 600 airfoil shapes from the United States, Britain, France, Germany, and Italy.<sup>45</sup> According to historian John D. Anderson, "[t]he airfoil data from those studies were used by aircraft manufacturers in the United States, Europe, and Japan during the 1930s,"<sup>46</sup> with the Boeing 247 being the first airliner to make full use of this aerodynamic knowledge.

Connectivity coexisted with two other "C's," competition and cooperation. Their interplay becomes evident from the juridification of air space and the conflicts arising from it. After the First World War, the League of Nations became the first large-scale intergovernmental organization. Its foundation, as Akira Iriye has remarked, resumed a process of internationalization that had begun in the nineteenth century but had been interrupted by the war. Still, "[a]s was suggested by the fact that the League of Nations started with thirty-two member countries, more than half of which were outside Europe, international organizations now were far more global in scope than before the war."<sup>47</sup>

It was in the context of this internationalist moment that aviation first became subjected to a legal framework. This international framework, the so-called Paris Convention of 1919, however, reinforced national borders.<sup>48</sup> Defining the sky as part of a state's territory, it stipulated that "every Power has complete and exclusive sovereignty over the air space above its territory. [...] [T]he territory of a State shall be understood as including the national territory, both that of the mother country and of the colonies, and the territorial waters adjacent thereto."<sup>49</sup> For imperial governments signing the agreement, this implied that in order to establish air routes to their colonial outposts, they had to negotiate overfly rights with all

independent states, big and small, as well as with the colonial territories of other imperial powers, lying *en route*.

The international convention fostered competition since the nationalization of air space allowed governments to become veto players in the planning of imperial air routes. It enabled them to grant or withhold access rights based on their own agendas. In Persia, modern-day Iran, the government refused Imperial Airways air access until the British company would include Persian cities as intermediate stops on its air route. The Persian state had already proven its receptiveness to the new technology by commissioning the operation of air links to the German aircraft manufacturer Junkers in 1927, who was to operate an airline within the country. With its demands on Imperial Airways, the state apparently sought to climb on the bandwagon of a growing global infrastructure network. Yet, instead of seeking diplomatic solutions, Imperial Airways shifted its operations to the Arabian Peninsula, where the empire successfully negotiated the construction of an aerodrome.<sup>50</sup>

On the same air route, from England to India, the airline faced a second diplomatic challenge. Italy had locked British airplanes out of its air space, causing travelers to touch down in Paris and board trains in the direction of Brindisi in southern Italy, from where they continued their journeys on flying boats after a two-day train ride. It was only after the mid-1930s that both countries reached an agreement, and the entire distance between London and its imperial outposts was opened for air travel.<sup>51</sup>

In the Americas, competition over air space arose after the mid-1920s between Pan American Airways and SCATDA. This Columbian airline had been founded in 1919 by German immigrants and had since established a network within Columbia, using Junkers F 13 planes.<sup>52</sup> When the airline ventured to expand its field of operation beyond Columbian borders northwards, however, U.S. officials became increasingly concerned with its supposed German allegiance. They per-

<sup>50</sup> Gerald Butt, *History in the Arab Skies. Aviation's Impact on the Middle East* (Nicosia, 2011), 88–98.

<sup>51</sup> Higham, *Air Routes*, 137; McCormack, "Airlines," 93.

<sup>52</sup> See Rinke, "Junkers."

**53** van Vleck, *Empire*, 64–65; Benson, “Chosen Instrument,” 99–100; David Haglund, “De-lousing Scadta. The Role of Pan American Airways in U.S. Aviation Diplomacy in Colombia, 1939–1940,” *Aerospace Historian* 30/3 (1983): 177–182, 187–190. For a detailed analysis of U.S. aviation politics in the Americas, see Wesley Phillips Newton, *The Perilous Sky. U.S. Aviation Diplomacy and Latin America 1919–1931* (Coral Gables, FL, 1978).

**54** Benson, “Chosen Instrument,” 107.

**55** “PANAIR–SCADTA,” *Pan American Air Ways* 1/2 (1930), 15.

**56** Kranakis, “European Civil Aviation,” 300.

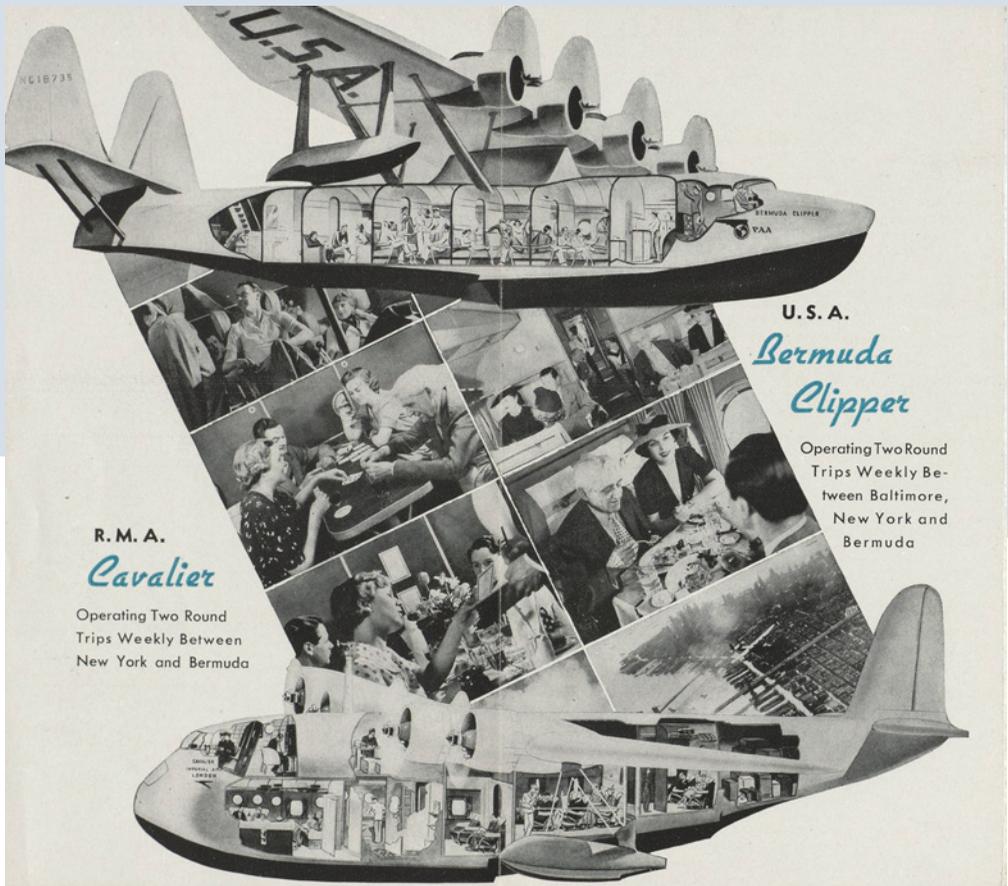
**57** Caprotti, “Visibility,” 388.

ceived SCATDA’s ability to fly over Panama as a threat to the Canal Zone, an U.S. overseas possession. To contain SCADTA’s influence, U.S. officials applied a two-pronged strategy. First, they obstructed the Colombian airline’s economical ambitions to transport airmail between North and South America by denying it landing rights in Florida. Secondly, they encouraged the foundation of Pan American Airways as a counterweight that could monopolize the Central American air space.<sup>53</sup>

The outlined cases provide ample evidence of conflicts between different states, imperial formations, and their respective airlines. Especially the case of SCADTA and Pan American Airways, however, also hints at simultaneous collusion hidden beneath apparent competition. In February 1930, Pan American Airways secretly bought up the Columbian airline but allowed SCADTA to continue its operations.<sup>54</sup> Both airlines entered into an agreement according to which they cooperated in the transfer of passengers, baggage, and goods. SCADTA was allowed to make use of Pan American Airways’ radio stations, and both airlines agreed to share all airports and seaplane anchorages along their routes.<sup>55</sup>

The U.S. American–Colombian cooperation was not unique but a typical feature of interwar aviation. Airlines of different nations pooled their flights or operated specific routes together. This made particular sense on empire routes on which distances were naturally very long.<sup>56</sup> A joint Africa route, for instance, was operated by British and Italian aircraft. Despite the ongoing competition over Italian air space, an agreement was signed in 1935 between Imperial Airways and Ala Littoria, the Italian national airline, according to which the British carried Italian mail and passengers from Brindisi to Khartoum. From there, the Italian carrier operated its own trunk route to Asmara and Addis Ababa, the centers of the newly formed colony of Italian East Africa.<sup>57</sup>

The French imperial administration, on the other hand, used its sovereignty over air space to make their (metropolitan and colo-



nial) neighbor Belgium share in the costs of operating air routes in Africa. In 1930, the French government allowed Belgium to open a route across French overseas territories to the Congo but made it a precondition that this route was to be operated as a joint Franco-Belgian venture and would expand to Madagascar, the French colony in the Indian Ocean.<sup>58</sup> Another joint venture was the U.S.–British service to the British colony of Bermuda in the Atlantic. The Hamilton–New York route was operated twice a week by Pan American Airways and Imperial Airways, using the flying boats of both companies.<sup>59</sup>

In addition to what would today be called “code sharing,” the major airlines of different imperial and non-imperial states also engaged in the international standardization of practices and materials, often with the aim of mitigating expenses and friction. The International Air Traffic Association (IATA) was formed as a nongovernmental organization in 1919 by airlines from Germany (which had not been invited to sign the

**Figure 3.** *New York - Bermuda in 5 hours: Timetable-tariff of Pan American Airways and Imperial Airways (1938).* University of Miami Libraries Digital Collections.

<sup>58</sup> Marc Dierikx, *Clipping the Clouds. How Air Travel Changed the World* (Westport, CT, 2008), 12–13; Jean Demangeot, “La construction du faisceau de transport aérien France-Archipel malgache,” *Cahiers d’outre-mer* 18 (1965), 369–405, here 369.

<sup>59</sup> Bhimull, *Empire*, 101–122.

<sup>60</sup> Kranakis, "European Civil Aviation," 299; Ralph S. Cohen, *IATA. The First Three Decades* (Montreal, 1949).

<sup>61</sup> *Ibid.*, 41, 49.

<sup>62</sup> *Ibid.*, 64.

Paris Convention), Britain, Sweden, Denmark, and the Netherlands. Later, airlines from different countries joined the trade association, including France and Belgium.<sup>60</sup>

One main objective of the IATA was to support common standards for both safety and equipment. To minimize the risk of fire hazards, for instance, the organization recommended a specific smoke detector system to its members. Within its forums, airlines also exchanged information on accidents and technical innovations for their prevention. Regarding standardized equipment and practices, the IATA championed standardized pipe connections and fueling equipment so that any aircraft could use it.<sup>61</sup> Coordination was the IATA's second pillar besides standardization. A combined IATA ticket and baggage check became standard in 1934 and a committee sought to coordinate and smooth out the timetables of its members so that connections between different airlines were possible and uneconomical competition was avoided.<sup>62</sup>

The different instances of competition, cooperation, and connectivity outlined in this section confirm Hedinger's and Heé's argument that empires were not detached from one another but engaged in multiple intersecting processes. Already the examples provided in this section suggest that entanglements between different airlines were not isolated cases but a ubiquitous phenomenon. A systematic review of these interactions which takes into account a number of airlines and regional settings is thus necessary to identify patterns of commonality in the evolution of global aviation networks. Studying the three "C's" of aviation reveals the interconnectivity of seemingly separated networks.

### III. Global history in local perspective

The networks resulting from the transfers and interactions between and across imperial formations sketched out above are best characterized as transimperial, transcontinental, or global. Yet processes of global integration seldom took place exclu-

sively on the macro-level. Rather, global entanglements were often informed by processes on a more local scale, which they also shaped in return. As Sebastian Conrad reminds us: “[h]istory must be understood as a multilayered process, in which the different layers follow, to some extent, each its own respective logic.”<sup>63</sup> Only through a constant back and forth, Conrad argues, can we comprehend how global connections were shaped by local contexts and vice versa. In line with Conrad’s observation, in this section I propose a multilayered research framework to the study of aviation infrastructure. Because a global perspective on the formation of long-distance air routes seems natural, on the following pages I focus on the micro-level and argue the case for a “grounded” look at flying.<sup>64</sup>

Interwar aviation provides an appealing subject for adding local layers to the study of global networks because it was, surprisingly, firmly rooted on the ground. Aircraft in the 1920s and 1930s could only fly for short distances (at least in today’s terms) and only during daylight hours. Moreover, unlike today, airplanes were not meant to immediately connect two distant cities but, like railroads, made scheduled intermediary stops. The journey from London to Cape Town, for instance, was accomplished in 33 separate stages in 1935.<sup>65</sup> While this *modus operandi* required landing facilities along all routes, airline networks were even more extensive than the flight schedules suggested: additional emergency airfields and refueling stations in-between these stops ensured that aircraft could fly safely in all regions.<sup>66</sup> Pan American Airways, for instance, operated a total of 250 airfields across Central and South America as well as the Caribbean by the late 1930s.<sup>67</sup> Taking these different sites — intermediate stops usually comprising landing strips (or launches for flying boats), crew facilities, hotels, and fuel depots — as analytical microcosms, a close examination of how airborne infrastructure was operated on a day-to-day basis is capable of generating more nuanced interpretations of imperial globalization in the interwar decades.

<sup>63</sup> See Conrad, *Global History*, 137.

<sup>64</sup> For different notions of “groundedness” in imperial air travel, see Liz Millward, “Grounded. The Limits of British Imperial Aeromobility,” in *Empire and Mobility in the Long Nineteenth Century*, ed. David Lambert and Peter Merriman (Manchester, 2020), 195–215, esp. 208.

<sup>65</sup> Lucy Budd, “Global Networks Before Globalisation: Imperial Airways and the Development of Long-Haul Air Routes,” *Globalization and World Cities Bulletin* 253 (2007): <https://hdl.handle.net/2134/4666> [accessed March, 29, 2022].

<sup>66</sup> *Ibid.*

<sup>67</sup> Jonathan Ruano de la Haza, *The Rise of the United States’ Airfield Empire in Latin America, North Africa, the Middle East and Southern Asia (1927–1945)*, PhD thesis University of Ottawa, 2012, 2.

**68** For a review of the recent literature, see Jonas van der Straeten and Uta Hasenöhr, "Connecting the Empire. New Research Perspectives on Infrastructures and the Environment in the (Post)Colonial World," *NTM Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin* 24/4 (2016): 355–391.

**69** Stephen Graham and Nigel Thrift, "Out of Order. Understanding Repair and Maintenance," *Theory, Culture & Society* 24/2 (2007): 1–25, here 7.

**70** Higham, *Air Routes*, 321.

**71** Nicholas Stanley-Price, *Imperial Outpost in the Gulf. The Airfield at Sharjah (UAE), 1932–1952* (Brighton, 2012), 76; Pirie, *Air Empire*, 226.

Recent scholarly works on infrastructure in the colonial world have ventured beyond now-classic narratives of colonial infrastructure as omnipotent "tools of empire" and have, instead, illuminated the importance of local conditions and actors and how they negotiated, contested, and appropriated different technological interventions, such as automobiles and electricity networks. Furthermore, a growing number of studies explore the permanent demand for maintenance, repair, and tinkering in the operation of imperial infrastructure systems.<sup>68</sup> An analysis of the microcosm of imperial airline's ground facilities will add to both research strands by shedding new light on two interrelated aspects: first, it will reveal fissures within seemingly flawless global connections; secondly, it will help to re-assess the effects of imperial infrastructure on colonized societies and the spaces they inhabited.

Regarding the first aspect, there is the question of interruption and breakdown. In their influential essay "Out of Order" (2007), Stephen Graham and Nigel Thrift call for an analytical shift: away from how systems work to how they do not work, writing that beyond assembly "there are good reasons to think that, in the overall scheme of things, disconnection and disassembly are just as important [...]: failure is key."<sup>69</sup> This is particularly true for the airplane which, as a relatively new technology, was prone to failure in the 1920s and 1930s. Occasional fatal accidents were the most shocking demonstration of its incapacities. According to historian Robin Higham, during this time span accidents on Britain's imperial air routes cost 108 lives.<sup>70</sup> Failure, however, did not only occur in these exceptional events but on a daily basis. The flight schedules of all airlines were regularly disrupted by heavy rains, winds, fog, rough seas (in the case of flying boats), or technical problems, resulting in delays and cancellations.<sup>71</sup>

A shift in analytical scale provides new perspectives on how airlines coped with the threat of mechanical failure on the scene. So far, little is known about the organization of maintenance and repair works. Routine checks and refueling were



often performed during layovers or while passengers and crews were sent on sightseeing trips. In Pan American Airways' Latin American network, major nodal points such as Brownsville, Texas, and Cristóbal, Panama, served as maintenance bases in the early 1930s. Repair parts were kept in stores at these sites as well as in Mexico City and potentially other places. From there, pilots distributed parts and mechanics to outlying stations when they were needed, using Ford and Fokker airplanes.<sup>72</sup> The system of Pan American Airways provides a first insight into how the broader “meta-infrastructure” necessary for the operation of air routes functioned.

The inner workings of this “meta-infrastructure” are yet to be explored in full detail. A close examination of the everyday interaction on a variety of airfields will help further explore patterns of commonality and shared practices in the repair networks of different airlines, while also being attentive to regional differences and tailor-made adaptation strategies. Such an examination will help to answer a range of questions: how, for instance, was fuel brought to airfields in inaccessible areas? Did different aircraft operators share and exchange spare parts? Were repair parts stored on-site or could they be shipped around the globe immediately to prevent further delays? What was the role of improvisation and tinkering in keeping the system running? A passenger on Imperial Airways' London-Cape Town route, for instance, described in 1932 that the crew of his flight had to use a bicycle pump to fix a flat aircraft tire in Atbara, Sudan, because there were still

**Figure 4.** Havana (Cuba), maintenance on airplane, 1930. Photo: Frederick Gardner Clapp. UWM Libraries, AGSL Digital Photo Archive – North and Central America.

**72** S. Paul Johnston, “Thunderbird’s Nest,” *Pan American Air Ways* 4/1 (1933): 25.

73 M.A.U. Heathcote, "By Air Mail to Kenya," *Geographical Journal* 79/6 (1932): 502–506, here 504. For this trip, see Gordon Pirie, "Incidental Tourism: British Imperial Air Travel in the 1930s," *Journal of Tourism History* 1/1 (2009): 49–66.

74 Mary Louise Pratt, *Imperial Eyes. Travel Writing and Transculturation* (London/New York, 2008), 7–8.

75 Stanley-Price, *Imperial Outpost*, 134–135.

76 Pirie, *Air Empire*, 240.

77 *Ibid.*, 236.

no other tools available.<sup>73</sup> Was this an exception or part of the daily routine of aviators? What was the role of local labor and expertise in the maintenance of global infrastructure?

This last question points to a second aspect of imperial aviation that can only be addressed through a close examination of the micro-social level: indigenous activity and initiative. Landing sites were "contact zones," in the words of Mary Louise Pratt: "social spaces where disparate cultures meet, dash, and grapple with each other."<sup>74</sup> On these spatial conjunctures, globally circulating commodities and technologies intersected with each other as well as with "local" or vernacular patterns of mobility and exchange. Actors of different status and with different backgrounds came into contact; aviators, dispatched engineers, colonial officials, business travelers, and tourists on the one hand, workers and local residents on the other. The overwhelming majority of staff was recruited locally and assigned tasks such as guarding facilities, maintaining landing strips, or operating fuel pumps.<sup>75</sup>

A focus on indigenous labor provides new avenues for re-evaluating the transformative power of imperial infrastructure — and imperial dominance built on it. For British aviation, Gordon Pirie has identified airfields as sites of micro-colonialism, writing that "[i]n some secluded places British ground crews, aircraft and airfield facilities were the Empire."<sup>76</sup> To be sure, imperial aviation and its local manifestation differed from empire to empire and from region to region. Still, zooming into different local contexts may help to reveal practices shared by multiple empires and their airlines. One example is the utilization of forced labor in the construction of airfields. In Britain's African colonies, ground facilities were constructed with the aid of the respective colonial authorities, often involving involuntary labor. Construction was performed by tax defaulters or *corvée* workers, who were also responsible for the maintenance of airfields after the rainy season, when grass and thornbush usually covered the landing strips.<sup>77</sup>



**Figure 5.** Sudan. Malakal. Shiluks refueling the plane, 1936. Matson Photo Service. Library of Congress, Prints and Photographs Division.

While Imperial Airways drew on the colonial state apparatus, Pan American Airways usually had to construct airfields and marine terminals on its own. Still, the company could make use of labor coercion. Labor for construction work was recruited locally, often from among the indigenous population. According to Marilyn Bender and Selig Altschul, the airline's representatives in southwest Bolivia allied with the local police force to conscript indigenous men for the construction of an airfield in the town of Uyuni.<sup>78</sup> This episode suggests that the coercive power underlying the U.S. airline's foreign mission was not necessarily less significant than that of European airlines operating in parts of their formal empires. Moreover, construction projects in Liberia, an independent state with strong ties to the United States, suggest that the intermediary actors supporting these efforts were very similar to those in formal colonial settings: as a chronicle compiled by the company in 1944 reported, at the planned seaplane base at Lake Piso in western Liberia it was a missionary station that helped the U.S. company obtain its African labor force.<sup>79</sup>

Further research is needed to determine how common patterns of involuntary labor and forced recruitment for the purpose of airfield construction and maintenance were in different geographical settings, colonial or not, and for the benefit of different airlines. To what extent, for instance, did Pan American Airways' operation in formal parts of the U.S. empire, such as Hawai'i or American Samoa, differ from

**78** Bender and Altschul, *Chosen Instrument*, 164.

**79** University of Miami Library, Pan American World Airways Records, ASM0341008730, "History of Pan American World Airways," 70.

**80** Marc Augé, *Non-Places. Introduction to an Anthropology of Supermodernity* (London, 1995).

**81** Clapperton Chakanetsa Mavhunga, "Introduction. What Do Science, Technology, and Innovation Mean from Africa?" in *What Do Science, Technology, and Innovation Mean from Africa?*, ed. idem (Cambridge, MA, 2017), 1–27, 2.

that in independent states or territories of other empires? Meticulous study of the available archival evidence is also required to assess the capabilities of labor regimes at airfields and the contestation of foreign power. How did those pressured into work react to coercive regimes? Did they refuse to engage with the infrastructural arrangements, for instance by neglecting their duty to clear airfields? What impact might such refusals have had on the route networks at large? Could the subaltern contestation of infrastructure on the scene affect flight schedules and eventually lead to delays or even the shutdown of entire long-distance routes?

These questions make the need for multilayered analyses particularly evident. Studying the engagement of actors on (and from) the spot with aviation infrastructure is pivotal for understanding how global and local layers intersected in the process of its construction and operation. Far from being "non-places," a term anthropologist Marc Augé uses to characterize modern airports, these facilities were firmly rooted in the surrounding environment and the lives of its inhabitants.<sup>80</sup> As a global history of aviation can show, it was through their activities at airfields that vernacular actors, those people usually identified as immobile and often being prohibited from entering an airplane, became a part (or a spanner in the works) of global networks of mobility. Looking at the micro-level thus allows us to understand non-European actors not as passive recipients or victims of technology transfer but as agents; or, in the words of Clapperton Chakanetsa Mavhunga, "not as outsiders looking in but as coauthors."<sup>81</sup>

#### **IV. Global connections revisited**

In this section, I introduce a third avenue for studying the global history of air transport, that is, the question of global integration and exclusion through the expansion of airline networks. The interconnectedness of the globe is a

long-established topos in scholarly research on the modern era. In his book *The Condition of Postmodernity* (1990), geographer David Harvey argues that in the twentieth century global integration sped up with such rapidity that “the world sometimes seems to collapse inwards upon us.”<sup>82</sup> To visualize what he calls “time-space compression,” Harvey’s book contains an illustration entitled “The shrinking map of the world through innovations in transport which ‘annihilate space through time.’” It depicts a series of four images of planet Earth, each smaller than the previous one. The globe is shrinking through accelerated means of transport: from the large Earth of “1500–1840,” when the “best average speed of horse-drawn coaches and sailing ships was 10 mph” to the 1950s (“propeller aircraft: 300–400 mph”) and 1960s (“jet passenger aircraft: 500–700 mph”).<sup>83</sup> Remarkably, similar visual depictions of the “ever-shrinking world” had already been used by Pan American Airways’ marketing department as early as the 1930s.<sup>84</sup>

Harvey’s illustration is both correct and incorrect. It is correct in that it emphasizes the key role of transport infrastructure in forging geographical links. But contrary to Harvey’s understanding, geographer Scott Kirsch has argued that new technologies did not in fact annihilate space. According to Kirsch, technological innovation instead “create[d] spaces, making heretofore isolated lands accessible to more rapid and expansive networks of exchange.”<sup>85</sup> This observation certainly holds true for the expansion of air links in the 1920s and 1930s. In the first two sections of this article, I have already pointed to crucial factors that shaped global connections, namely, the desire to bring imperial outposts closer to the motherland and to dominate the skies for geostrategic reasons, but also the veto power of different states to grant or deny access to air space. To these factors we can add another factor that determined which places were to be connected, namely, the range and technical capabilities of aircraft, their unique ability to bridge not only great distances but also difficult terrain with relative ease.

<sup>82</sup> David Harvey, *The Condition of Postmodernity. An Enquiry into the Origins of Cultural Change* (Cambridge, MA, 1990), 240.

<sup>83</sup> *Ibid.*, 241.

<sup>84</sup> “This ever-shrinking world,” *Pan American Air Ways, Supplement ‘The Yankee Clippers Sail Again’* (1939), 16.

<sup>85</sup> Scott Kirsch, “The Incredible Shrinking World? Technology and the Production of Space,” *Environment and Planning D: Society and Space* 13/5 (1995): 529–555, here 542.

**86** Percy Groves, "The Influence of Aviation on International Affairs," *Journal of the Royal Institute of International Affairs* 8/4 (1929): 289–317, here 307.

**87** Emily S. Rosenberg, ed., *A World Connecting, 1870–1945* (Cambridge, MA, 2012).

Aviation therefore created economic and social spaces that remained barred to other means of transportation. In 1929, Royal Air Force strategist Percy Groves proclaimed that "[p]laces which were of great importance geographically under the old values have now, perhaps, lost much of it, and other places which were of no special value in the old days have become exceedingly important as fuelling depots or points on lines of communication."<sup>86</sup> This was particularly true in scarcely populated tropical regions, in which automobile traffic was seldom fully developed by the 1930s. Instead, transport away from the coastlines was often done by porters, carts, or railroads. Railroad tracks, however, involved great expense, were static, and sometimes could not traverse difficult terrain, such as mountainous regions. The airplane, by contrast, possessed the ability to connect peripheral regions to one another and to urban centers.

However, there is a second layer to the process of global and imperial integration, which reveals where Harvey's above-mentioned earth projection is wrong. His model oversimplifies integration by means of infrastructure extension because it obscures inequalities and suggests a straightforward, teleological process. The technological possibility of connecting distant places did not necessarily mean that actors actually connected them. Moreover, access to global networks, in the interwar period as much as today, is not distributed equally but based on power relations and supposed racial hierarchies. In the remainder of this article, I will propose an analytical framework designed to take account of both increasing global interconnectedness and exclusion in the interwar period.

Studying the interconnectedness of the modern world is, perhaps, the primary objective of global history writing. However, while the focus on "a world connecting," as the title of an outstanding book in the field reads, has become a paradigm for many studies, global historians are increasingly wary of the dangers underlying a positivistic view on connectedness.<sup>87</sup> Sebastian Conrad has urged us to go beyond the study of global connections as a guiding principle, warning that

connections are not uniform but of varying quality and intensity and thus often have only limited impact upon historical actors.<sup>88</sup> Roland Wenzlhuemer has gone one step further and suggested that historians give limited connections, missing links, and what he calls “disconnections” the same historiographical attention that they give the ubiquitous connections.<sup>89</sup> Indeed, exclusion and interruption were important aspects in the formation of global aviation networks, and we can think of them in at least two ways: people and places.

Regarding people, the world clearly did not shrink for everybody. Access to airplanes was regulated along the lines of race, class, and gender.<sup>90</sup> Interwar flying, as Marc Dierikx has underlined, “was a white man’s business.” On the Dutch air routes to Indonesia, which he studied, up to 95% of passengers were European, the rest were Chinese, and only a very few were Indonesian.<sup>91</sup> Being European, however, was not sufficient to qualify for air travel. High ticket prices resulted in low passenger numbers. The list of frequent flyers was thus reduced to colonial officials, business travelers, military personnel, diplomats, and upper-class tourists. On the eve of the Second World War, Imperial Airways still counted less than 10,000 passengers per annum on its intercontinental routes.<sup>92</sup>

These passengers from Europe or North America did not regard the inhabitants of their flight destinations as potential co-travelers. Rather, in the eyes of tourists, entrepreneurs, or colonial officials, these populations were an immobile “other” that was to be gazed upon.<sup>93</sup> In western discourse, flying signified modernity and thus the antithesis of the lives of the people over whose heads airplanes traveled. With regards to Pan American Airways’ African operations Jenifer van Vleck has thus concluded that “[a]viation itself became an important signifier of racial difference. Africans’ lack of familiarity with airplanes, which often manifested as fear or bewilderment, marked them as uncivilized in the eyes of U.S. observers.”<sup>94</sup>

Such representations notwithstanding, the skies were not completely closed to non-white travelers and their busi-

**88** Conrad, *Global History*, 90.

**89** Roland Wenzlhuemer, “Connections in Global History,” *Comparativ* 29/2 (2019): 106–121; Wenzlhuemer, *Globalgeschichte*, 73–78.

**90** Pirie, *Air Empire*, 240–241.

**91** Dierikx, *Clipping the Clouds*, 33.

**92** Pirie, “Passenger Traffic,” 68; Bhimull, *Empire*, 75.

**93** Bhimull, *Empire*, 84–85.

**94** van Vleck, *Empire*, 160.

95 Caprotti, "Visual-ity," 396.

96 Ibid.

97 For this observation, see also Nicholas Stanley-Price, "Flying to the Emirates: The End of British Overseas Airways Corporation's Service to Dubai and Sharjah in 1947," *Journal of Transport History* 39/3 (2018): 333–354.

98 For the history of the airfield, see Stanley-Price, *Imperial Outpost*.

99 Ibid., 74.

nesses. As Federico Caprotti has shown for Ala Littoria's flights to Ethiopia, "East African dignitaries and local officials did, at times, utilize the airline, especially on the internal East African network."<sup>95</sup> Their presence made white passengers complain bitterly and eventually led to the segregation of the cabin.<sup>96</sup> A closer examination of how airlines and state legislation administered access to aircraft will help illuminate the unevenness of global connections. This approach also has the capability of exploring the ways in which colonial subjects transgressed these racial boundaries and made use of the new technology.

Turning to the question of geographical "disconnections," it is perhaps obvious that while some places were connected, others remained excluded. What is perhaps less expected is that recently established connections were sometimes unmade in the process of infrastructure extension. Interruption occurred when air technology advanced.<sup>97</sup> The development of seaplanes and their use on long-distance routes from the late 1930s through most of the 1940s rendered previously erected land-based airfields superfluous. This was the case in Sharjah in today's United Arab Emirates, where an airfield was constructed in 1932 by the Royal Air Force and Imperial Airways. From 1933, the airline stopped weekly at the airfield on the route to and from Karachi, and in 1935 air traffic was increased to twice-weekly arrivals in both directions.<sup>98</sup> In the same year, however, Imperial Airways made a decision that sealed the fate of Sharjah airfield for the next two decades: the airline purchased 28 flying boats from the manufacturer Short Brothers, whose S23 C Class (or Empire Class) seaplanes soon became the preferred aircraft on empire routes.<sup>99</sup>

With their introduction, ground facilities shifted from land to the sea, and destinations without adequate access to water were excluded from flight schedules. The new British air route to India thus went from Alexandria via Tiberias, Baghdad, Basra, Bahrein, and Dubai to Karachi while the airline abandoned its former stops in Gaza and Sharjah. In Sharjah, the local creek was not found suitable for landing operations.

Instead, the British moved westward to Dubai, where the first commercial flying boat landed in 1937.<sup>100</sup> While the rest facilities in Sharjah were still occasionally used for passengers arriving in Dubai, commercial services at the airfield stopped and the Royal Air Force remained its sole user. It was only in the 1950s that passenger traffic at the Sharjah airfield was revived, albeit only for regional airline activities. In 1975, the airfield was given up due to its proximity to the fast-growing city. Its runway was transformed into a regular urban street, and a new airport was constructed outside of the city limits.<sup>101</sup>

**100** Ibid., 81.

**101** Ibid., 177.

Whether intended or not, exclusion was a by-product of innovation and of the very process of global interconnection itself. This brief sketch of how some places and people were excluded while others were included underlines that connection and isolation were not mutually exclusive but entangled processes, whose simultaneity reflected technological change as much as power relations and global unevenness. Only a balanced focus on both aspects can do justice to the ambiguous process of global integration. Moreover, a study that pays close attention to the meandering patterns of connectivity and contextualizes connections can also provide a methodological contribution to the growing academic field of global history writing.

## V. Concluding remarks

In this article, I have sought to develop a conceptual template for studying the global history of aviation. Three core aspects of the proposed research agenda venture beyond traditional historical frameworks. First, its transimperial approach not only facilitates the exploration of the competition between different empires and states, but also helps to highlight more hidden fields of interaction and cooperation in the extension of infrastructure across borders. Second, zooming in on the local trajectories of global infrastructure “grounds” aviation in its application in everyday life. Addressing the question of how aviation transformed not only air space but also terrestrial space, a study of the ground level illuminates how

infrastructure systems played out on the spot in different geographical settings and how local conditions and actors created ruptures in these sophisticated networks. Third, moving beyond merely identifying global connections by exploring weaknesses in global links and processes of disentanglement will bring to the fore the contradictions inherent to globalization processes.

Applying a global history perspective to the study of airborne infrastructure means overcoming a national framework and instead searching for entanglements, shared practices, and patterns of commonality but also for regional differences. Such a research agenda is particularly fruitful in aviation history, which is still often written as a history of daring national pioneers or specific national airlines. Beyond the study of aviation, the research agenda outlined in this article proposes an innovative perspective on processes of global and imperial integration in the twentieth century. The study of imperial airlines in interaction with one another not only underscores that imperialism was a shared project of different states. Shifting the analytical scale from the macro-level to the micro-level and back also reveals the challenges that imperial globalization faced in the interwar decades.

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