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Aircraft carriers and the capacity to mobilise US power across the Pacific, 1919–1929

Alison J. Williams

School of Geography, Politics and Sociology, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK

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ABSTRACT

This paper analyses how aircraft carriers were developed and positioned within US Navy planning for war in the Pacific during the first decade of the interwar period. Building on Caren Kaplan’s framing of military mobility as a capacity, the paper contends that as carrier technologies advanced during the 1920s so recognition of their capacity to act as more than simply mobile islands tasked with supporting the big guns of the fleet emerged. The paper draws on a range of primary sources, specifically pertaining to War Plan Orange (the US’s plan for war against Japan primarily developed during the 1920s and 1930s), and analyses US Naval War College documents that positioned carriers, often aspirationally, as key tools of US Pacific power projection. Inflected through discussion of two US Fleet Problems – naval exercises which took place in 1924 and 1929 – the paper contends that the emergence of a recognition that the capabilities of both ship and aircraft needed to be considered in tandem offered new and important strategic opportunities for US war planners during the interwar period.

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Mobilisation is defined as active and open preparation for war…. M-Day is the first day of mobilisation…. M-Day may precede a declaration of war.

The Airplane Carrier is distinctly an offensive weapon carrier and to fulfil this role should: (a) Be capable of projecting bombing flights in as great strength as possible. (b) Be as mobile as possible. (c) Possess appropriate defensive capabilities.

These two quotations encapsulate the concerns of this paper. The first provides definitions of mobilisation, as set out in the 1929 revision of War Plan Orange, the US Navy’s plans for war against Japan. It clearly illustrates the centrality of the process of mobilisation in the realisation of such a conflict. The second comes from the US Naval War College in 1926, during a set of discussions focused on the size, composition and objectives of the US Navy’s future aircraft carriers. It elucidates the core raison d’être of carriers: to be mobile and project power. This paper investigates how the US Navy sought to plan and prepare for conflict across the Pacific and how aircraft carrier technologies and strategies were enmeshed in these processes during the first decade of the interwar period. It foregrounds the classical geopolitical notion of ships as mobile islands in order to consider how the evolution of US aircraft carriers, their utilisation in US naval exercises (known as Fleet Problems), and their role within War Plan Orange were bound up in their capacities to project US power across the Pacific. To do this, the paper employs a lens for analysis that draws on mobility research and geopolitical scholarship to position mobility as a constellation of complex and often messy capacities to act.

This approach enables us to analyse the significance of the carriers’ capability to project power through both sea based and airborne assets and to understand how this was represented in and through a range of textual sources and practical exercises.

The paper draws on archival documents pertaining to War Plan Orange and discussions within the US Navy to enable an understanding of how the aircraft carrier was positioned as a tool of US power projection, and how the perception of what aircraft carriers offered in terms of mobility developed as technologies advanced...

1 Department of the Navy, Navy Basic Plan – Orange, Part I – The Strategic Plan, March 1929, United States National Archives and Records Administration, College Park, Maryland [hereafter NARA CP], Research Group [hereafter RG] 38, Strategic Plans, War Plans Division, WPL Series, WPL-13, Box 15, 83.

2 Commander R.R. Stewart, US Navy, Airplane Carriers (letter to the President, Naval War College), 10th June 1926, United States National Archives and Records Administration, Washington DC [hereafter NARA DC], RG 80, General Records of the Navy Department, Office of the Secretary of the Navy, Formerly Secret Correspondence, 1927–1939, Box 253, 1.


and war games and fleet exercises indicated their capabilities and limitations. This material, supported by key secondary sources, provides significant insight into the development of US planning for war in the Pacific, and specifically the role and place of aircraft carriers within those plans. In considering the aircraft carrier components of War Plan Orange, and the mobility of the carriers, as represented in both planning documents and in actuality, this paper offers new perspectives on how the US Navy planned to mobilise its carrier forces to project its power across the Pacific in the event of war with Japan. This demonstrates how a mobilities perspective offers new insights into the debates that surrounded the role and place of carriers in the US Navy during the interwar period.

The paper is structured as follows. The next section reviews relevant literature from military mobilities, aerial geopolitics and the geographies of maritime spaces and ships to provide a conceptual framework based on mobility as a capacity to act. The following three sections analyse how the US Navy, through its plans, reports and training exercises, sought to understand and develop its aircraft carrier strategy during the first decade of the interwar period. These sections consider how the carriers’ capacity to mobilise significant aircraft operations was debated and developed by a naval preoccupation focused on the battleship. Finally, the conclusion returns to the key conceptual ideas that frame this paper to note the utility of positioning mobility as a capacity to act when investigating the multiple and intersecting mobilities that influence how military forces plan for and operate power projection.

Conceptualising the military mobilities of aircraft carriers

As the introduction to this special issue notes, there is a wealth of scholarship from a number of subject areas that analyses military movements. Of course, historians and political scientists are amongst those who have contributed the most to this. Within contemporary human geography there has been less engagement with the military and with military mobilities as a subject of enquiry. Those geographical engagements with military mobilities that have taken place have tended to focus on the embodied mobilities of the patrolling soldier, the flying fighter-jet pilot, and the sailor aboard a ship at sea. Whilst there are a multiplicity of other mobilities and many ways to make sense of them, I seek to draw here upon Caren Kaplan’s work to define military mobility as a capacity: a power to, or limitation on the ability to, move military bodies and materiel across space in order to project state power. The conceptualisation of mobility as a capacity to act has been discussed in other contexts, primarily as something that affects bodies and spaces. These engagements overlap with Kaplan’s work in recognising that movement is not a flat, linear, universal endeavour, rather that ‘capacities to move’ are messy, individualised and unique and are spatialised and multi-scalar. As such, this builds on Tim Cresswell’s assertion that mobility can be usefully construed as a constellation, a concatenation of interrelationships between movement, its representation and its practices. Rather than focusing exclusively on the practices of movement in relation to the physical motion of aircraft carriers themselves, this paper considers how the potentiality of military forces to be deployed, to operate and project state power beyond its borders can also be identified through a number of US Pacific war plans and associated US Navy documents. Moreover, it argues that the particular potentiality of aircraft carriers is recursively inflected through these, changing across the period considered in important ways. This approach seeks to ‘reveal the means by which movement is enacted’, and connecting this with geopolitical considerations of how power is projected across space makes it possible to consider ‘entanglements of movement, power and politics’ in this context. This enables consideration of how military forces prepare for the possibility of conflict — both in actuality and performatively through war planning and gaming, the writing and dispersal of mobilisation schedules, and discussions and reports on the characteristics and construction of new military technologies — and for the realisation of specific military mobilities in practice. To understand the specific potential and actual mobilities of aircraft carriers and their aircraft we need to engage with two sets of literature: those addressing aerial and maritime mobilities.

In recent years the concept of aeromobilities has emerged as a way of understanding the experiences of being-in-the-air from the perspective of the civilian air traveller. Within this work, significant insights have been gleaned by those who have strayed from civilian air worlds into those inhabited by military aviators and controlled by military air forces. Engagements with the military aerial have come from a range of quarters, although most focus on the centrality of technological capabilities to the achievement and management of military aerial mobility. Peter Adey’s work has been pivotal in opening up discussion of how pilots’ bodies have traditionally been made ready for aerial work through the use of military training methods to physically prepare them for flight. Others have questioned the changed modes of movement operationalised through the use of drone technologies, providing an insight into how mobilities have become differentiated by the separation of the constitutive elements of the drone assemblage:

8 Kaplan, Mobility and war.
14 Adey, Aerial Life; P. Adey, ‘Ten thousand lads with shining eyes are dreaming and their dreams are wings’: affect, airmindedness and the birth of the aerial subject, Cultural Geographies 18 (2011) 63–89.
the pilot and their aircraft.\textsuperscript{15} Both of these examples have focused on how bodies become militarised in the course of becoming aerially mobile in different ways, and how those processes are different from those that soldiers or sailors might experience.

This paper, however, is concerned with the machines that these militarised bodies work within and which enable them to perform their aeromobility: the ship-borne aircraft, and its carrier, and the plans that underscore the operation of these technologies. Alongside extensive work by military historians on aerial military strategy and tactics a smaller number of social scientists have written, albeit mostly indirectly, about aerial military movements at this scale. For example, in previous work on the use of air power in the enforcement and maintenance of international boundaries, I have illustrated how states can seek to limit the capacity to move through the use of air power to secure these border zones.\textsuperscript{16} Kaplan’s work similarly places and analyses the role of air power in the creation and maintenance of US defence.\textsuperscript{17} She notes the intersections between war and mobility, but also draws attention to the inconsistencies in these often too linear linkages. Further, she seeks to dispel the idea that air power is a singular homogenous entity, illustrating instead how aerial mobilities can be differently experienced, described and represented. For example, whilst the threat of air strikes can be argued of self-defence, this recedes if not backed up through ‘shows of force’ from aircraft in the skies.\textsuperscript{18} Thus, conceptualising aerial mobility as a capacity to act enables us to connect both its actual performance and its performative potentiality in texts which state what it can do and how it will be done.\textsuperscript{19} This paper, through a specific focus on aircraft carriers, seeks to add further empirical support to these ideas, illustrating how the multiplicity of intersecting personal and technological mobilities that enable aircraft carrier operations have a geopolitical importance as they relate to capabilities to project power across oceanic space.\textsuperscript{20}

This relationship between geopolitics and oceanic space was recognised by classical geopolitical scholars such as Alfred Mahan and Nicholas Spykman, whose work has been of fundamental importance to geopolitical understandings of the role and place of naval power in international relations and conflict.\textsuperscript{21} In their work they defined geopolitics as the ability of states to project their power across space, most specifically into spaces beyond their own international boundaries. As such, maritime space and the craft that utilised it were of inherent geopolitical importance. In the first decade of the twentieth century Halford Mackinder wrote of ships as mobile islands, and more recent work by Deborah Cowen, amongst others, has considered the geopolitics of ships.\textsuperscript{22} Phillip Steinberg’s thesis on the social construction of the ocean also includes important consideration of military mobilities at sea, arguing that oceanic space can be mobilised as a military space through its use by military technologies. Whilst being concerned with a broad range of human-ocean engagements and entertainments, Steinberg offers an insight into how we can conceptualise the ocean as a military ‘force-field’.\textsuperscript{23} The representation of maritime space as a three-dimensional theatre of warfare, a physical space in which conflict occurs, but also a space from, across and through which the potential of military power can be cast beyond the immediate physicality of the ship is key when considering the significance of aircraft carriers and their military mobilities. As will be illustrated below in discussions of the specifics of US Pacific war planning, the perceived ability of carrier aviation to extend the scope of this power projection came to be of key importance in the development and planned deployment of the US Navy across the interwar Pacific.

Recent work has also sought to recognise oceanic space as an assemblage, suggesting the need to acknowledge that maritime space is not simply a flat plane that can be traversed as if in a state of suspended animation.\textsuperscript{24} Rather, oceans and seas have a corporeality, composed of and performed by the multiplicity of bodies and objects that inhabit and encounter them. Steinberg, writing with Kimberly Peters, engages with recent work on volume and verticality, and calls for an engagement with maritime space that recognises its inherent four-dimensionality, as well as its concurrent fixed yet fluid, tangible yet ‘ungraspable’ nature. Their call for a ‘wet ontology’ that recognises the assemblages of materialities, discourses and practices that make up life within volumetric oceanic spaces offers a significant way forward, and is especially useful when considering the perceived role of aircraft carriers.\textsuperscript{25} This work combined with literatures that focus upon the geographies of the ship enables us to move beyond homogenised notions of the ‘ship’ and the ‘sea’ to unpack and illuminate the multiple, complex, and sometimes competing, geographies of ships in seas.\textsuperscript{26} Recognising that every ship has a unique spatiality, and thus capacity to act, both within its hull and through the movement of those inhabited hulls through maritime space, these authors have added much depth and detail to our understandings of these vessels and their activities. Much of this literature has focused on the ships used to transport African slaves to the Americas and the effects of this trade.\textsuperscript{27} Other work has focused on the mobilities of container ships, and those that, in a variety of guises, seek to use maritime spaces for illegal reasons.\textsuperscript{28} However, little work within contemporary human geography has explicitly engaged with naval


\textsuperscript{16} Williams, Hakumat al Tayarrat.

\textsuperscript{17} Kaplan, Mobility and war.


\textsuperscript{19} A.J. Williams, Reconceptualising spaces of the air: performing the multiple spatialities of UK military airspaces, Transactions of the Institute of British Geographers 36 (2011) 253–267.

\textsuperscript{20} Cresswell, Towards a politics of mobility.

\textsuperscript{21} See A.T. Mahan, The Interest of America in Sea Power, London, 1898; N. Spykman, America’s Strategy in World Politics, New York, 1942. Both were contemporary to the interwar period: Mahan through the influence of his work on US Navy doctrine of the period and Spykman because his writings were informed by living through this time.

\textsuperscript{22} Mackinder, Britain and the British Seas; Mackinder, The Nations of the Modern World; D. Cowen, The Deadly Life of Logistics: Mapping Violence in Global Trade, Minneapolis, 2014.


\textsuperscript{24} P. Steinberg, Of other seas: metaphors and materialities in maritime regions, Atlantic Studies: Global Currents 10 (2013) 156–159.

\textsuperscript{25} P. Steinberg and K. Peters, Wet ontologies, fluid spaces: giving depth to volume through oceanic thinking, Environment and Planning D: Society and Space 33 (2015) 252.


technologies or military maritime mobilities.\textsuperscript{29} This matters for two reasons. Firstly, and most obviously, limiting ourselves to studies of civilian or commercial shipping risks overlooking a sizeable number of the ships that utilise maritime spaces. Secondly, and more importantly, this oversight leads us to fail to recognise the fundamental differences between the purposes of mobility for commercial and military shipping. Unlike commercial shipping, whose key aim is to move across the oceans between two land termini — remaining intrinsically linked to the littoral spaces of ports and harbours to fulfil their raison d’être — the aim and objective of military vessels is to remain at sea, enacting a geopolitical force-field. Naval power projection is enabled and maintained fundamentally through the deployment of ships at sea and their movements within maritime space. Ships in port are far less effective, in a similar way to aircraft on the ground or, in the case of aircraft carriers, on the flight deck.\textsuperscript{30} Work on maritime mobilities that focuses on commercial shipping is, therefore, only of limited use when trying to understand the specific mobilities of naval technologies.

Taking these literatures together, and noting their limitations, illustrates that consideration of the mobilities of aircraft carriers offers a way to begin to consider the specific implications of naval power projection for understandings of military mobilities and the geographies of ships. As Adey has illustrated, thinking aerially requires us to consider how the ground and the air, the horizontal and the vertical, are intertwined and mutually constructed.\textsuperscript{31} Thus, through an analysis of the relevant planning and discussion documents, as well as key naval exercises which relate to the use of US aircraft carriers in the Pacific between 1919 and 1929, the following sections will illustrate that we not only need to recognise that naval ships have different geographies to commercial shipping, but also that aircraft carriers have fundamentally different potential mobile capacities and capabilities to other craft, analysis of which offers a different understanding of what maritime military mobilities are perceived to look like and what outcomes they enable.

**Placing the US Navy in the interwar Pacific**

During the first years of the twentieth century relations between the US, UK, China and Japan were predominantly cordial, and political lives in the Royal Indian Navy mutiny, between the US, UK, China and Japan were predominantly cordial, flying. In addition, the granting of the League of Nations’ mandate for the former German island territories in the western Pacific to Japan, which effectively cut the US Navy’s ability to steam directly from Hawaii to its outposts in the Philippines, caused tensions to emerge between the US and Japan.\textsuperscript{34}

In 1918 the US Navy General Board proposed a significant building plan that would strengthen the battle fleet across the region, and by 1921 the navy had repositioned its main fleet from the Atlantic to the Pacific with ten battleships stationed off the west coast.\textsuperscript{35} Early post-war Pacific war planning focused on the potential for a battleship campaign, based not only on dominant US naval doctrine of the period, as inspired by Mahan’s work, but also grounded in the technological realities of a big gun focused, battleship-led fleet.\textsuperscript{36} For instance, the Office of Naval Operations began drawing up plans for a number of ‘impregnable safe havens’, island bases at Pearl Harbor, Guam and in the Philippines that the US Navy could use as way-stations for its battleships to enable them to project US power across the Pacific. However, almost immediately the navy was stymied first by congress, who refused to fund its building programme, and then by the election of a new president, Warren Harding, whose aim was to drive global arms limitation.\textsuperscript{37} Indeed, whilst recognising that military strategy and government foreign policies are not shaped in a vacuum, the US Navy’s position in the Pacific during the first decade of the interwar period is significant in that it was predominantly shaped through the anti-militarism ideals of the president, the return of congress to a relatively isolationist stance, and the fight against this by the US military. The US Navy’s recognition of, and reaction to, British and Japanese military activities was largely ignored by the US government for much of the period in question, and thus the US Navy’s capacity to act was unable to meet its desire to project its power and prepare for conflict.

The Washington Naval Conference of 1921–1922 illustrates this point. The key treaty signed there laid down a 5:5:3 ratio for US, UK and Japanese capital ship construction.\textsuperscript{38} It also set limitations on the numbers and tonnages for a range of naval ship classes, in effect constraining the size of the naval fleets of the US, UK, France, Italy and Japan, and halting battleship and battlecruiser construction. Whilst numerically the treaty still favoured the US in the Pacific, once distance calculations and the limited mobility of a long supply train and its impact on the capabilities of the fleet were taken into account, the treaty gave Japan the capacity to become a significant regional power in the western Pacific. The 1922 treaty also prevented the US from being able to build any new naval bases (including naval air bases) on its island possessions west of Hawaii (see Fig. 1).

Since land-based long range bombers, such as the US’s Curtiss B-2 Condor, had an operating radius of approximately seven hundred nautical miles these treaty stipulations effectively put any naval operation more than three hundred and fifty miles west of Hawaii beyond the range of land-based aircraft.\textsuperscript{39} These limits thus restricted the US Navy’s capacity to project power in three-dimensions in the western Pacific to carrier aircraft only. However, the US congress was unsupportive of repeated requests for funds to build the navy to the levels defined by the treaty. As Edward Miller’s seminal work on War Plan Orange acknowledges, in the event of conflict it was recognised that Japan would seize the


\textsuperscript{30} See Williams, Hukumat al Tayarrat, 507–510.

\textsuperscript{31} Adey, *Aerial Life*, 2.


\textsuperscript{33} Wray, Japanese-American relations and perceptions, 5.


\textsuperscript{35} Baer, *One Hundred Years of Sea Power*, 83 and 91.


\textsuperscript{37} See Baer, *One Hundred Years of Sea Power*, 92–93.

\textsuperscript{38} Baer, *One Hundred Years of Sea Power*, 99–100. For more on the details of the Washington treaty see http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html, last accessed October 2015.

lightly defended American outposts of Guam and the Philippines, and the US Navy ‘would be unable to prevent these takeovers’. Thus, in spite of Japan’s growing militarism and active naval construction to meet its treaty limits, an increasingly isolationist and anti-military US government meant that the US Navy’s position in the Pacific became increasingly challenging during the interwar period.

Early post-war Orange planning and carriers as mobile islands

In the US in the early post-war period the aircraft carrier was predominantly considered a support vessel for the battleship fleet. As Craig Felker notes, US Navy Board hearings in January 1919 agreed that naval aviation needed to be deployed beyond existing land bases to provide scouting duties for the fleet, and as such needed to be ship-borne. However, whilst naval aviation was recognised as having a ship-based role, many argued that the US Navy could utilise small numbers of floatplanes that could be carried on and launched by a variety of ship types, such as cruisers or tenders, rather than requiring purpose built carriers and aircraft. As

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40 Miller, War Plan Orange, 4.
such, for several years after the First World War, the US perceived aircraft carriers to be of secondary importance, to be utilised as generic mobile islands. They were little more than ‘depot ships’ that could offer support and maintenance for floatplanes, and resupply facilities for other ships within the fleet, rather than offensive weapons that could enable new forms of maritime mobility. Their aircraft were predominantly tasked with ‘reconnaissance and artillery spotting’ duties for the battle fleet ‘and the denial of these advantages to an enemy’. Much of this resulted from the predominance of Mahanian gun battle advocates within the upper echelons of the US Navy, leading to a failure to develop carrier technologies to the same extent as the US’s rivals. Together with the limitations of the Washington treaties and an unsupported congress, these dominant perceptions resulted in the US having only one carrier for much of the 1920s, the USS Langley, which was a converted collier with poor speed, limited aircraft handling and little if any offensive capabilities.43

The Langley entered service in 1922 and was initially converted to be able to carry nine aircraft. This was later expanded to a complement of twelve fighter and twelve spotter aircraft.44 Its launch and recovery operations were so constricted that it took twelve minutes to recover a plane and clear the deck.45 It had a maximum speed of 25 knots and a range of 3500 nautical miles.46 As Friedman notes, the Langley ‘was never more than an experimental carrier, unable to keep up even with battleships, let alone operate with fast scouting forces’.47 As such, the Langley’s capacity to act as part of the battle fleet was severely limited, and a gap emerged between what it was realistically possible to achieve and what was desired in terms of carrier operations and strategy for fighting a Pacific war. Elements in the US Naval War College and naval aviation supporters within the navy’s Bureau of Aeronautics and War Plans Division advocated for an Orange war plan that placed multiple carriers within the fleet. However, the Mahanian dominated General Board and battle fleet hierarchy continued to position naval aviation as a support to ‘gun ship’ operations. The power of this ‘big gun’ element within the navy meant that the Langley was the only carrier deployed for five years, and its significant aerial and maritime mobility limitations consequently limited the development of carrier air strategy within the US Navy.48

In spite of the US government’s reluctance to act offensively in terms of naval construction or deployment, the army and navy continued to develop plans for war against Japan. By 1923 work on War Plan Orange had begun to coalesce with a set of clear strategic objectives emerging. The Basic War Plan, published in June 1923 and known as WPL-8 in the navy’s planning nomenclature, responded to the fleet’s repositioning in the Pacific and the limitations of the Washington treaties, setting out detailed strategic and operational plans for war across the Pacific. At the core of this plan, and the various documents which encompass its strategic, readiness and operating plans for conflict with Japan, are the mobilisation schedules, from which the first quotation at the beginning of this paper comes. Analysis of how these mobilisation plans developed during the various iterations of the Orange plans, as undertaken by Miller, provides an insight into how a range of political and practical considerations formed a constellation of capacities and limitations to act.49

The first volume of WPL-8 set out ‘the conditions of readiness for war to be attained and maintained in peace’.50 In other words it was a plan that would enable the fleet to be mobilised should war be declared. It stipulated that this would be accomplished by a movement from Hawaiian Islands to Manila Bay, to begin 14 days after zero [M] day, by a force of active units at least 25% superior to the total Japanese naval strength, accompanied by 50,000 Army troops; and a subsequent westward supporting movement by the removal of the US Fleet from the Hawaiian Islands, not later than 60 days after zero [M] day.51

A subsequent memorandum to the Joint Army and Navy Board in 1924 provided the geographical extent of the theatre in which these mobilisations would take place: ‘[t]he area west of one hundred and forty (140) degrees west longitude, and east of one hundred (100) degrees east longitude’ (see Fig. 1).52 The 1923 iteration of WPL-8 details that, in the event of this mobilisation, the aviation component of the Pacific Battle Fleet would consist of the flagship, USS Langley, accompanied by its tender, USS Gamma.53 Given the limitations of the Langley in terms of its speed, operating radius and aviation complement, it is clear that the 1923 version of War Plan Orange offered an unrealistic expectation of what an aircraft carrier could provide to the fleet in terms of either defensive or offensive mobile capabilities.

In addition to the realities of the ships available and the ideals of the war planners, preparations for war in the Pacific had a third axis, as the US Navy undertook training exercises, known as Fleet Problems, at least once a year. Developed to enable possible tactics and technological advances to be tested under operational conditions, and in an attempt to mitigate the limitations of deployment forced upon the navy by the Washington treaties, these Fleet Problems played a significant role in the complex and messy evolution of the role of carriers within the Orange plans. The Langley was first deployed as part of these exercises in Fleet Problem Four in January 1924, and its role illustrates the positioning of carrier aviation within US war planning of the period. For most of the exercise the Langley’s small complement of aircraft undertook scouting duties for the battleships’ guns. They were not tasked with seeking out enemy aircraft, nor with acting offensively, until the very end of the exercise when forced to react to an attack on the fleet by the ‘enemy’s’ land-based air force. This engagement effectively proved the Langley’s role as a mobile island, with its aircraft operating as any shore-based defensive naval aviation unit would to defend their base against attack.54

Arguably, this tactic was advanced in part by the dominance of the Mahanian battleship cohort within the US Navy, but the impact of the Washington treaty’s limitations on the construction of

43 Friedman, US Aircraft Carriers, 7, 9, 35–36.
44 Compare this with the USS Lexington which was launched in 1927 and could carry a complement of eighteen fighters, eighteen bombers, twenty scouts and eighteen torpedo bombers. See Friedman, US Aircraft Carriers, 389–390.
45 See Friedman, US Aircraft Carriers, 36 and N. Friedman, Fighters over the Fleet: Naval Air Defence from Biplanes to the Cold War, Barnsley, 2016, 32.
47 Friedman, US Aircraft Carriers, 37.
48 For information on the role and aims of the Bureau of Aeronautics, see T. Hone, N. Friedman and M. Mendez, Innovation in Carrier Aviation, Naval War College, Newport Papers, Newport, Rhode Island, 2011. See also Felker, Testing American Sea Power, 47.
49 Miller, War Plan Orange.
50 Department of the Navy, Basic Readiness Plan, 25th June 1923, NARA CP, RG 38, Strategic Plans, War Plans Division, WPL Series, WPL-8, Box 7, 13.
51 Department of the Navy, Basic Readiness Plan, 25th June 1923, NARA CP, RG 38, Box 7, 18.
52 Joint Planning Committee, February 1924, Memorandum to the Joint Board, NARA CP, RG. 165. WPO. Box 268.
53 Department of the Navy, Basic Readiness Plan, 25th June 1923, NARA CP, RG 38, Box 7, Appendix B, 3.
54 Felker Testing American Sea Power, 42–43.
airfields west of Hawaii also had an influence. Indeed, the Navy Department’s Special Board on Shore Establishments (known as the Rodman Board), which had reported a year before Fleet Problem Four, reinforced the notion that the navy could offset the limits of the Washington treaty through the use of carrier aviation by stating that ‘The mission of naval aircraft is as follows: Operations from mobile floating bases or from naval air stations on shore (a) As an arm of the fleet (b) For overseas scouting’. In Fleet Problem Four this was exactly how the Langley was mobilised. And so the emergence of carrier operations within the US battle fleet in 1924 can be clearly linked to concerns about how to replace the capacity to build and utilise island airfields in any future Pacific conflict.

This illustrates the messiness of the development of the US Navy aircraft carriers’ capacity to act, and the range of overlapping and opposing constituencies that influenced this. Whilst some scholars point to Fleet Problem Four as a key point in carrier development, when considered through a geopolitical mobility lens, and in concert with the Rodman Board’s definitions, it becomes clear that whilst the Langley acted as a mobile island (or floating base as Rodman describes), able to launch and recover aircraft to defend its position, it did little offensively. In addition, contemporary commentators noted the Langley’s inability to launch and recover aircraft in anything other than calm seas during daylight. Thus, whilst Fleet Problem Four may have idealistically indicated the potential of carrier aviation, in reality the Langley operated as little more than an artificial island. Its speed limitations, in comparison to the fleet’s capital ships, and its aircraft’s operating tactics ensured that it was most effective when fixed in one location with calm sea conditions. Furthermore, following Steinberg and Peters’ call for us to be attendant to the maritime environment and its capacity to affect movement, we can see how the movement of the waves diminished the Langley’s ability to operate in strong seas and thus impacted upon its ability to project US power in certain sea conditions. This exemplifies the utility of developing a critique based on mobility as a capacity to act as it enables us to analyse how a variety of factors could enable and limit the functionality of US aircraft carriers during this period. 

As such, we can see that the Langley offered little capacity to be truly mobile or reactive to changing maritime, atmospheric or tactical requirements.

The emergence of carrier mobility and Fleet Problem Nine

It was not until the next two converted carriers, the USS Lexington and USS Saratoga, entered the fleet that the carrier began to be perceived as more than simply a mobile island (see Fig. 2). The enhanced capabilities of these two carriers, in concert with emergent debates at the US Navy War College on future carrier characteristics and tactics that were realised in exercises, illustrated the capacity of aircraft carriers to act as independent offensive weapons within the US fleet. When the Lexington and Saratoga entered service in 1927 and 1928 respectively they enabled a significant advance for the US Navy in terms of its capacity to project power. The USS Saratoga, for example, had originally been designed as a battleship but was converted to a carrier part way through construction as a result of the Washington treaty limits. Designed to provide a maximum aviation complement of seventy aircraft, including fighters, bombers and scout planes, the Saratoga enabled the US Navy to begin to close the gap between the aims of War Plan Orange and the realities of what the navy could put to sea. The ship had a maximum range of ten thousand miles and a top speed of thirty knots, thus it could sail with and manœuvre as part of the battleship fleet. Coupled with that, by the outbreak of the Second World War, the aircraft carried aboard the Saratoga included the Grumman Avenger torpedo bomber, which had an operational range of a thousand miles and a top speed of 275 mph. The Saratoga was able, through dint of its improved technical capabilities, to offset the impact of wind speed and direction, and wave height, which had so significantly limited the mobility of the Langley. These intersecting ship and aircraft ranges, speeds and capabilities gave the Saratoga a significant element of dynamic mobility, enabling the navy to project US power across a significant swathe of the Pacific through the presence, or threat of the presence, of both the carriers and their aircraft.

Acknowledging the agency of the sea within aircraft carrier operations enables us to consider the ways in which the materialities of wave height, movement and wind speed intersected with the capacities of these ships. Their ability to act as part of the fleet was not only related to their cruising speed and range, but also the fluid and changing environment in which they were deployed. The capabilities of the Lexington and the Saratoga exceeded those of the Langley through physical differences in hull size and advances in the technologies of the aircraft they carried. These worked within a messy and dynamic assemblage of sea, air, wind, ship, discussion papers, strategic plans, deployment tactics and human capabilities to produce a more effective capacity to act. Here, then, we can see how a complex assemblage of materials and discourses combined to enable a more capable aircraft carrier type to emerge.

Although neither the Lexington nor the Saratoga were built as carriers from the keel up, it is clear from US Naval War College and Bureau of Aeronautics documents from the second half of the 1920s that their construction, and the Langley’s deployment in fleet problems, continued to spur debate within the naval establishment as to the role and scope of carriers and their air wings. This can be illustrated through analysis of a set of documents outlining aircraft carrier characteristics produced by the college during 1926 and 1927. As the second quotation at the start of this paper illustrates, the Naval War College was one of the key places in which discussion about what carriers could provide for the US fleet was undertaken. Speed was quickly identified in a 1926 report by Commander R.R. Stewart as ‘an essential quality in both the carrier and the plane’ with a recognition that ‘the faster the carrier and the greater the cruising radius the better’. Here, then, mobility was defined as the capacity to move as quickly as possible and for as long as possible, providing the defensive capability to outrun enemy craft and weaponry, and the offensive capacity to attack targets at a distance. Stewart’s colleague, Captain J.W. Greenslade, commented, just months after Stewart, that the US Navy should advance a policy of building ‘the maximum number of smaller carriers obtainable from the allotted tonnage’ as stipulated under the 1922 treaty regulations. His reasoning centred on the perceived capacity for carriers to move in particular ways, stating that a fleet of smaller carriers would increase the ‘mobility of [the Navy’s] air force as far as carrier

55 H. Rodman, Report of the Special Board on Shore Establishments, Navy Department, 12th January 1923, NARA DC, RG 38, Chief of Naval Operations, Shore Stations Development Board, Box 15, 1586.
57 Steinberg and Peters, War on ontology.
58 The photograph in Fig. 2 is available at https://commons.wikimedia.org/wiki/File:US_carriers_Bremerton_1929.jpg, last accessed July 2017.
59 Friedman, US Aircraft Carriers.
62 Stewart, Airplane Carriers, 10th June 1926, NARA DC, RG 80, Box 253, 2–3.
63 Capt. J.W. Greenslade, Memorandum regarding characteristic of carriers, 12th November 1926, NARA DC, RG 80, General Records of the Dept of the Navy, Office of the Secretary of the Navy, Formerly Secret Correspondence 1927–1939, Box 253, 2.
units are concerned. This would improve the US Navy’s ‘ability to put planes in the air more rapidly and consequently to concentrate them for attack or defense.’ Thus, Greenslade positioned carrier mobility as three-dimensional and identified that carrier mobility could be related to one or other or both of its component elements: movement at sea and in the air.

Both of these assessments are illustrative of a debate within naval circles during this period relating to how best to utilise the tonnage limits dictated to the US Navy by the Washington treaty. These focused on whether a small number of large carriers or a large number of small carriers would offer the best options for Pacific power projection. In a memorandum from October 1926 the advantages and disadvantages of the many smaller carriers option are played out, with conclusions reaffirming that ‘a larger number of small carriers is to be preferred to a smaller number of large carriers’ and that these ‘carriers should be of very high speed’. Although not using these terms, this debate was concerned with how the US Navy would develop its capacity to act within this potential theatre of conflict. It is also illustrative of the gap between the capabilities of the ships afloat (and even those under construction) and the performative potentialities writ large in War Plan Orange and Naval War College discussion documents. This debate provides significant insight into how naval decision-making circles positioned carrier mobility at the time.

The three-dimensionality of carrier operations was also recognised, with Greenslade discussing the need for different types of aircraft to provide different operational capabilities rather than the dimensions of the carrier dictating the composition of its air wing. Fighter planes were needed to secure the airspace around the fleet and observation-bombers were necessary to enable the gun ships to operate effectively and to provide additional air-to-ship attack capabilities. As such, these reports recognised the need for carriers to be deployed with a number of different types of aircraft aboard, offering the capacity to engage in a variety of different conflictual spatialities. However, this also limited the mobility of these ships through their need to attend to the differing requirements of the small, fast, fighters and the larger more cumbersome bombers. Thus, in noting that ‘Carriers should be so constructed as to carry various types of planes rather than one type only’ the commentators of the Naval War College in the latter half of

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64 Greenslade, Memorandum regarding characteristic of carriers, 12th November 1926, NARA DC, RG 80, Box 253, 2.

65 Anon, Memorandum regarding characteristics of carriers, 25th October 1926, NARA DC, RG 80, General Records of the Dept of the Navy, Office of the Secretary of the Navy, Formerly Secret Correspondence 1927–1939, Box 253, 4 and 6.

66 Greenslade, Memorandum regarding characteristic of carriers, 12th November 1926, NARA DC, RG 80, Box 253, 4–5.
the 1920s influenced the potential capacities to act for future carriers.67

This can be seen most significantly in the final document of this series, from April 1927, in which the president of the Naval War College, Rear Admiral William V. Pratt summarised the preceding documents and provided conclusions to the Chief of Naval Operations on his preferred size, speed and aviation complement for the US Navy’s future carrier force. Looking to a point beyond the experimental Langley to a time when keel-up carriers would become the norm, and the US Navy was no longer hamstrung by carriers converted from other ship types, Pratt offered a set of five carrier and aircraft characteristics he deemed most pertinent to the US Navy’s needs.68 Fundamental to this were the mobility related elements raised by Stewart and Greenslade: the size and speed of the carrier, and the characteristics of its air wing, to which Pratt added the ship’s protection and armament. In addition, Pratt argued that the vast distances between land-based airfields, that would be a key feature of any Pacific war, precipitated the need to consider how aircraft carriers would be required to act.69

Pratt’s report is significant in that it illustrates his informed perspective on both the capacity and limitations of carriers’ potentialities during this period and indicates the messiness that geography brings to this consideration. It also speaks to the debates discussed above about whether a small number of large fleet carriers or a fleet of smaller carriers was more useful. These are indicative of the centrality of mobility as a set of capacities to do a multiplicity of things, possibly simultaneously. Pratt noted that the fleet of smaller carriers option had

strong arguments in its support, such as mobility and flexibility for various tasks, greater scouting area, security (due to more ships) both in regard to number of decks left after a hostile attack and better chance of planes being recovered, mutual support ... and last but not least the larger number of planes put aloft.70

He argued that this formulation ‘cannot be too strongly emphasised’ in relation to the development of tactics for fighting a long range naval campaign because in order for the US Navy ‘to advance into a hostile zone the fleet must carry with it an air force that will ensure, beyond a doubt, command of the air’.71 Pratt’s report clearly illustrates that those tasked with considering the potentialities of carriers were definitively moving away from the mobile island/depot ship premise of the Langley towards something much more dynamic, three-dimensional and offensively enabled. The effect of this evolution of opinion on the possible role and functions of carriers and their capacity to act is best illustrated through two further examples: first, a report written by Rear Admiral William Moffett, the chief of the navy’s Bureau of Aeronautics in 1928; and, second, Fleet Problem Nine, which took place in 1929.

Moffett was an advocate of naval aviation, arguing that the aeroplane was a naval weapon and as such its utility to the fleet needed to be proved to those who continued to favour the battleship.72 Moffett’s role in advocating for carrier aviation was particularly significant, as he sought to position it within the US Navy rather than being independent of it. This positioned carriers as having a double mobility. Their aerial operating capabilities were understood as entwined within, not additional to, the maritime operating capacities of the fleet in which they were deployed as had been the case when the Langley fulfilled the mobile island ideal of the ‘big gun’ supporters. As such the mobility of carrier-borne aircraft emerged as something significantly different to their land or sea based peers, in that they were not simply flown from a fixed point to complete a mission and then return. Instead they were launched from a moving platform that changed its position in terms of its location within the fleet and the theatre of operations. Moffett illustrated these connections by requiring naval aviators to think of themselves as naval officers first and aviators second, indicating that their primary focus should be with the fleet and how their aviation capabilities could support it. As such, Moffett’s concern was to advocate for carriers that could operate as much more than simply mobile support and aircraft depot ships. Instead, he saw them as tools that would be part of the fleet’s offensive capabilities.73 This perspective can be seen in the report he produced for the Secretary of the Navy and the Chief of Naval Operations in August 1928, entitled ‘The Influences of Developments in Naval Aviation on the Development of the Art and Material of Naval Warfare’.74

Moffett’s report offered his perspective on the role and place of carriers and their aircraft within US Navy operations and sets out his vision for how they could provide defensive and offensive opportunities that would enable the fleet to be successful in conflict and thus how they should be positioned in War Plan Orange. Key to this was his recognition that carrier aircraft have multiple tasks to fulfil, thus requiring a multiplicity of carrier tactics to be developed rather than operating in just one role. This is elucidated in his comments about the use of carrier aircraft in spotting targets for the battleships’ guns. He noted that:

in order to enable battleship observation planes properly to execute their mission, it is absolutely essential that one carrier deck be available near the battle line for the specific purpose of reserving these planes, of providing replacements and of basing protective fighters.

He further argued that:

If the LEXINGTON and SARATOGA are to fulfil their missions as at present conceived, they will have full need of all their aircraft and deck area for other operations. Also their legitimate operations may call for their presence in an area too far distant to serve battle line planes.75

Here, then, following Pratt’s comments, is the development of a much more complex idea of carrier mobilities than previous debates over the size and number of carriers had considered. Moffett advocated not only for more carriers but for a multiplicity of carrier roles that would influence the size and composition of their air wings, and from that their role in War Plan Orange and US power projection. In subsequent paragraphs of his report Moffett set out additional carrier aviation roles, including the use of bombers to provide a threat to submarines and thus support convoy operations, the use of fighters to accompany bombers tasked with attacking ‘enemy coastal defense guns’, and the use of aircraft ‘to spot naval gunfire, to drive off enemy bombers, to attack shore...

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67 Anon, Memorandum regarding characteristics of carriers, 25th October 1926, NARA DC, RG 80, Box 253, 2.
68 W.M. Pratt, Airplane Carriers, 11th April 1927, NARA DC, RG 80, General Records of the Dept of the Navy, Office of the Secretary of the Navy, Formerly Secret Cor-respondence 1927–1939, Box 253.
69 Pratt, Airplane Carriers, NARA DC, RG 80, Box 253, 3–4.
70 Pratt, Airplane Carriers, NARA DC, RG 80, Box 253, 2.
71 Pratt, Airplane Carriers, NARA DC, RG 80, Box 253, 2.
73 Baer, One Hundred Years of Sea Power, 140–142.
74 Moffett, The influences of developments in naval aviation, NARA DC, RG 80, Box 253.
75 Moffett, The influences of developments in naval aviation, NARA DC, RG 80, Box 253, 7.
batteries and troops, for communication and reconnaissance work, and to spot temporarily for army gunfire' during the seizure and defence of beachheads. This list of potential carrier aviation tasks drew heavily upon tactics from the Orange Plans but, unlike those documents, it set out the requirements for a range of carrier types to enable these tasks to be accomplished. Moffett thus redefined the understanding of maritime space as a military force-field, perceiving the carrier's area of operations as a three-dimensional volume in which a whole range of offensive and defensive tasks could be undertaken. Through this document, Moffett built on Pratt's earlier assessment to bridge the gap from the positioning of carriers as mobile islands serving the fleet through defensive and support functions to needing to provide a multiplicity of carriers and aircraft to conduct a range of tasks that offered strategic and spatial dynamism. Indeed, he concluded that 'the advent of aircraft as practical weapons of ships in actual every day operations of today is leading to important changes in ship characteristics, in naval tactics and in our entire tactical concept of offensive operations at sea'.

Whilst Moffett was clearly a naval aviation advocate and had a vision of how carriers could evolve fleet operations, perhaps the most significant event in shaping how their capacity to act was understood during this period came a few months after his report was published. Fleet Problem Nine, which ran during January 1929, provided, for the first time, both participating fleets with access to viable aircraft carriers as the Lexington and Saratoga were both deployed. Additionally, and significantly, one of the fleets operated their carrier, the Saratoga, independently to the fleet, tasking it with an aerial operation on the enemy's main strategic land base rather than slaving it to provide air cover and scouting for the battle fleet's guns. Whilst successful, counter attacks by the Lexington's aircraft on the Saratoga's fleet highlighted the need to be able to split a carrier's aircraft to provide both offensive and defensive tasks simultaneously as Moffett had outlined. In spite of this vulnerability, most commentators concurred that operating the Saratoga in a much more dynamic way than previously trialled was a significant strategic advancement. The successes of the Lexington and Saratoga in Fleet Problem Nine provided a challenge to existing naval doctrine as 'Mahanian maxims [proved] increasingly tenuous when tested against weapons operating in three dimensions'.

Following a review of the exercise, the commander of the navy's Air Battle Fleet, Rear Admiral Reeves, advocated for the deployment of carriers independent of the main fleet with their own mobile screening force to mitigate the vulnerability of steaming without the perceived protection of the fleet's big guns.

With Moffett's report and the outcome of Fleet Problem Nine, for the first time the unique capacities of carrier mobility were beginning to be fully recognised and strategic planning began to move to meet the carriers' potential rather than expecting them to fit within previously composed plans. Whilst the unusual deployment of the Saratoga during Fleet Problem Nine had offered the opportunity to reconsider the most fruitful way to mobilise carriers, the advances in aircraft technologies and the size advantages the Saratoga and Lexington had over the Langley (until then the only other carrier deployed during such exercises) were also important. As Wildenberg notes, the size and weight constraints imposed on carrier aircraft had produced some significant engineering developments. Army aircraft launched from land bases during Fleet Problem Nine were heavier, slower and less agile than their carrier-borne competitors which quickly outmanoeuvred their opponents thanks to lighter and more efficient engines. Thus, through this exercise, the carriers' capacity to act was realised through three-dimensional mobilities that, through the novel deployment strategy employed by the Saratoga and its carrier configured aircraft, began to indicate the utility of the aircraft carrier as a tool with a volumetric mobility.

**Conclusions**

Fleet Problem Nine probably raised as many questions and uncertainties as it answered, and deliberations along the lines of those illustrated above continued to affect the development of carrier design decisions, such that the US Navy remained largely battleship fleet focused well into the 1930s. Whilst the numbers of advocates of carrier aviation grew, and the deployment of carriers in War Plan Orange and further Fleet Problems enabled their potential capacities to act to be further tested, the US remained behind its Pacific rivals in the development of a viable and useful carrier fleet that could project its power across the region. However, as this paper has shown, work by a number of key figures combined with the aims of the war planners and the evidence brought by the Fleet Problems combined to effect changes in how the US Navy's aircraft carriers were perceived and utilised to project power across the Pacific and prepare for war with Japan.

This paper has sought to build upon Caren Kaplan's notion of military mobility as a capacity to analyse how these mobilities can be usefully considered as capacities to act, arguing that this approach enables us to consider not only the specific movements of military personnel and materiel but also requires us to look behind those end points into the complex and messy processes through which decisions are made that influence how those eventual movements are shaped and formed. Significantly, in terms of considerations of military mobilities it enables us to analyse the strategic plans for movement that military forces make, the debates and discussions that frame those, and the technological possibilities and limitations that influence these and how they are tested. Importantly, thinking about military mobility as a capacity to act requires us to think not only about all these factors but also about the gaps between those plans and ideas and the realities of what military forces can (and cannot) do. As such, it requires us to conceptualise military mobility as both the movements made but also the discourses about and representations of those eventual physicalities.

From a geopolitical perspective, this approach provides an important additional lens through which to consider how states seek to utilise their military materiel in the prosecution of their power projection aims, requiring us to think of power projection as being about both the specific movements of personnel and materiel and the underlying debates and discourses that enable them. Furthermore, whilst existing work on military mobilities within human geography has tended to focus on the minutiae of military life — for example, upon how the soldier's body is trained to move in certain environments — this paper has purposefully sought to reframe the frame of enquiry to bring geopolitical considerations to the fore and to enable a range of actors, organisations and technologies to be analysed. This enables an account of how military mobilities are idealised and actualised that recognises the messy

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76 Moffett, The influences of developments in naval aviation, NARA DC, RG 80, Box 253, 8–9.
77 Moffett, The influences of developments in naval aviation, NARA DC, RG 80, Box 253, 14.
78 Felker, Testing American Sea Power, 51.
79 Wildenberg, Destined for Glory.
80 Felker, Testing American Sea Power, 50.
81 Wildenberg, Destined for Glory, 60.
82 See Hone, Friedman and Mendelees, Innovation in Carrier Aviation, 50.
and complex ways in which technologies, military doctrine, geographical practicalities and geopolitical desires intersect. As such this approach enables us to consider how military forces act, and plan to act, over long time scales and to recognise how individuals and events can influence how the casting of these mobilities changes over time as policies, practices and technologies evolve.

In conclusion, this paper has sought to bring together ideas from geopolitical and mobilities literatures to advance the notion of mobility as a capacity to act as a useful lens through which military planning and military technologies can be understood in relation to the practical and performative means by and through which state power is projected across specific spaces. A focus on military mobilities requires the recognition of these sorts of intersections in order to illuminate the unique operational spatialities of military forces. As such, the notion of military mobilities as a capacity to act provides a significant way to engage with the multiplicity of factors, actors and spatialities assembled in the preparation of forces for conflict.

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