

From Auxiliary to Weapon: Japan and Britain's Changing Understanding of the Naval Tactical Role of Aircraft, 1910-1929

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補助手段から武器へ
—海軍軍用機の戦術的な役割に対する日本と英国の概念変遷、1910-1929—

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Summary

This article discusses how navies in Britain and Japan changed their understanding about the naval tactical role of aircraft in the 1910s and the 1920s. Introduced into both navies around 1910, aircraft was first seen as an auxiliary for supplementary tasks such as reconnaissance and spotting in naval operations. However, in practice, naval aviation pioneers of both countries found that the best use of aircraft is as a weapon to attack enemy vessels. The diffusion of such a new understanding in the two navies was conditioned by different organizational properties. In Japan, the close connection between naval centrals and aviation pioneers through committees and personnel shifts allowed aviation pioneers to promote their idea in the whole navy, and aircraft was explicitly accepted by the IJN as a weapon in 1928. However, similar pattern failed to complete in Britain after the independence of the Royal Air Force (RAF) in 1918, largely because organizational barriers established between naval aviation pioneers and naval centrals when most naval aviation pioneers left the RN to join the RAF, and then were neither allowed to take posts in the RN, nor to discuss their ideas about naval aircraft directly with their colleagues in the RN. Worsened the case was the RAF centrals' unconcern about the naval use of air force, which ruled out the possibility for naval aviation pioneers to promote their new understanding about naval aviation within the RAF. Thus, the naval tactical role of aircraft as a weapon was not recognized in Britain through the 1920s, and even well into the 1930s.

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1. Introduction

Like many other military innovations, the process of integrating aviation into traditional naval fighting did not unfold evenly among countries at the beginning of the twentieth century. Although Britain started relatively early in exploring the naval use of aircraft and possessed a most powerful naval air force by the end of WWI, she had become a straggler in this field by the beginning of WWII, especially when compared with Japan.

Such a difference is a result of multiple factors including strategic issues, geopolitical locations, etc. However, in this article, I would like to limit the discussion within the realm of ideas. Since the use of military force is inseparable with the idea about how it should be used,¹ such a reversal cannot be sufficiently explained without a look at different understandings about the role of aircraft in a future naval war in both countries. The difference was obvious: when the Imperial Japanese Navy (IJN) officially accepted that aircraft should be used as a weapon to “attack the hostile main fleet in assistance of friendly fleet” in *The Third Revision of Principles in Naval Operations* issued in 1928,² the attitude of the British Royal Navy (RN) towards whether aircraft should primarily be used to attack or to reconnoiter was ambiguous in the 1925 doctrine book *The Naval War Manual*, and such ambiguity continued into doctrine books issued in the 1930s.³

By using a historical approach, this article tries to shed light on the processes of changing understanding about the optimal tactical role of naval aircraft in both countries. The processes demonstrate that, military organizations seldom learn new technologies as a whole. Instead, they tend to begin with sending a small group of pioneers, who learn the technology and form their rational understanding about it through largely autonomous practices. Later, the small group try to spread their understanding into the whole organization. The effectiveness of military innovations is a result of the smoothness of ideational exchange channels between the group of pioneers and the original organization. In the following sections, I will first review related literature, and then analyze how navies in Japan and Britain learnt about the tactical role of aircraft by dividing such processes in two stages. New understanding about naval aviation started to appear in the first stage, and went on for diffusion in the second. Archives, memoirs, historical works and other first and second materials will be used. Conclusions come at the end.

¹ See Elizabeth Kier, *Changes in Conventional Military Doctrines: the Cultural Roots of Doctrinal Change*, Ph.D. Dissertation, Cornell University, 1992

² 防衛庁防衛研修所戦史部、『戦史叢書・海軍航空概史』、朝雲新聞社、1979、26頁

³ ADM186/66, *Naval War Manual*; ADM186/106, *Battle Instructions, 1928 – 1938*

2. Literature Review

Military innovation as a concept has been discussed by many scholars. Successful military innovation normally means effective mobilization and strengthening of national power. However, who should take credit for the success? Barry Posen argues that military organizations come with a need for certainty and institutionalization, which impede innovation until pushed, usually by some sensible civilian leader who feels the pressure of unfavorable security conditions.⁴ On the contrary, Stephen Rosen holds that innovations are more likely to be promoted by senior officers within military with new ideas and the power to promote them.⁵ Harvey Sapolsky argues that interservice rivalry causes competition for resources, thus may spur one service to work efficiently and facilitate military innovation.⁶ Such an argument is concurred by Owen Cote, who demonstrates that interservice conflict is “a powerful and independent source of innovative military doctrine.” and interservice cooperation is more likely to suffocate innovations.⁷ Nonetheless, Rod Coffey and Michael McNerney argues that interbranch politics may block innovation and interservice cooperation is needed to innovate.⁸

Apparently, the cases of military innovations are too varied and complicated to be generally covered by a few theoretical models, which also makes it crucial to comb through the specific processes of these cases. On the pre-WWII developments of naval aviation in Japan and Britain, researchers have argued that difference in paces of innovation could be explained by strategic factors such as the enduring economic difficulties⁹ and distracting multiple security threats¹⁰ faced by Britain; organizational factors such as the independence of the British Royal Air Force, which deprived the RN of future “air minded” senior naval

⁴ Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between The World Wars*, Cornell University Press, 1984, pp.40,59,224-226

⁵ Stephen Peter Rosen, *Winning the Next War*, Cornell University Press, 1991, pp20-21

⁶ See Harvey M. Sapolsky, *The Polaris System Development: Bureaucratic and Programmatic Success in Government*, Harvard University Press, 1972

⁷ Owen R. Cote, *The Politics of Innovative Military Doctrine: The U.S. Navy and Fleet Ballistic Missiles*, PhD dissertation, MIT 1998, pp.36-37

⁸ Rod A. Coffey, *Doctrinal Orphan or Active Partner: A History of U.S. Army Mechanized Infantry Doctrine*, Master's thesis, Army Command and General Staff College, Jun 2000; Michael McNerney, “Military Innovation During War: Paradox or Paradigm?”, *Defense & Security Analysis* Vol. 21, No. 2, pp. 201–212, June 2005

⁹ Geoffrey Till, “Adopting the Aircraft Carrier: The British, Japanese, and American Case Studies” in Murray, Williamson; Millet, Allan R, eds., *Military Innovation in the Interwar Period*, New York: Cambridge University Press, 1996, pp198-199

¹⁰ Ibid. pp202. See also Emily O. Goldman: “International Competition and Military Effectiveness: Naval Air Power, 1919-1945”, in Brooks and Stanley eds., *Creating Military Power: the Sources of Military Effectiveness*, Stanford University Press, 2007, pp158-185

officers and caused the marginalization of naval aviation in both services,¹¹ and in contrast, as the concentration and autonomy of naval aviation management in Japan, marked by the establishment of an “independent naval air headquarters”.¹²

However, these explanations are less than sufficient. The differences in strategic environment cannot explain why the scarcity of resource did not incite Britain to pursue more effective military methods (like naval air power) to protect her interests, which proved essential for dealing with her threats both in the Far East and in Europe.¹³ The establishment of the IJN Naval Aviation Department (海軍航空本部) in 1927 only “explains the impressive surge in the development of Japanese naval aviation from the mid-1930s”,¹⁴ but does not explain the constant development of Japanese naval aviation from the 1910s to the 1920s. Meanwhile, the ideational side of the development of naval aviation has not received enough attention. Naval doctrines during the interwar period in both countries were depicted as stably dominated by Mahanism which claims the guns of battleships as the core of naval power, and the attitudes towards naval aviation only “differed in the degree”.¹⁵

But historical researches indicate that change in ideas towards naval aircraft did exist.¹⁶ And in order to explain the difference in paces of adopting naval aircraft in both navies better, a detailed look into the processes in which understanding about the role of naval aviation changed is necessary. In other words, we need to know, who said what on naval aviation, and when?

3. Aviation Pioneers and the Formation of New Understanding

3.1 Introducing Aviation into the IJN: 1909-1916

In March 1909, the IJN as an organization learnt about aircraft for the first time from a Lieutenant Commander Yamamoto Eisuke. As a staff officer of the 2nd Department (dept. of armament) in Naval General Staff, Yamamoto sent a proposal to his director, in which he argued that the IJN should start researching about aviation as soon as possible since aircraft was potential to “become the ‘warship in the air’ with great combat capability, exerting its awesome power”¹⁷.

Receiving interest from the leadership in the 2nd Department and later Naval Minister

¹¹ Stephen Roskill: *Naval Policy Between the Wars, 1919-1929*, London, Collins 1968, pp.365-371, Geoffrey Till: “Adopting the Aircraft Carrier”, pp. 210-212

¹² Geoffrey Till: “Adopting the Aircraft Carrier”, p213

¹³ Till, *Air Power and the Royal Navy 1914-1945*, Jane’s London and Sydney, 1979

¹⁴ Geoffrey Till: “Adopting the Aircraft Carrier”, p213

¹⁵ *ibid*, p191

¹⁶ 立川京一、「旧日本海軍における航空戦力の役割」、『戦史研究年報』、2004年03期、22-32頁

¹⁷ 山本英輔、1957、『七転び八起の智仁勇』、未公開出版、早稲田大学図書館蔵、219-223頁

Saito Makoto, this proposal led to the establishment of a military-naval joint Temporary Military Balloon Research Committee (臨時軍用気球研究会) in July, 1909¹⁸ and finally an Aviation Research Committee (ARC) (海軍航空術研究委員会) owned by the IJN in June, 1912.¹⁹

As the only aviation related institution in the IJN at that time, the ARC was given only broad directions like researching on “aircraft manipulation”, “standards of naval military aircraft” and “other things about aviation”.²⁰ Led by the Director General of the 2nd Department Captain Yamaji Kazuyoshi²¹ and staffed by some young IJN officers with enthusiasm on aviation including Lt. Kaneko Yozo, who flew the very first Japanese naval flight later,²² the ARC had to decide what to do by itself.

It seems that Capt. Yamaji and his fellows started from exploring what could be done by aircraft. The research topics for 1913 included “long-distance aviation, reconnaissance, communication, selecting carrier, dropping bombs, machine guns for aircraft” which should be “conducted sequentially”.²³ In 1913, the ARC also conducted an unsuccessful gun-spotting exercise showing that spotting task could only be fulfilled with much more advanced technologies in aviation and communication.²⁴ In March 1914, after a 6-month mission around Europe and America, Capt. Yamaji gave a talk about naval aircraft in the naval club “Suikoukai (水交会)”, saying that the naval utility of aircraft could be “reconnaissance, following and bombing against submarines”, “warning about sea-mines”, “reconnaissance over the sea and above hostile ports” and “menacingly bombing hostile ports”.²⁵

These tasks were only partly tested in the soon coming belligerence. In the autumn of 1914, a temporary “Naval Air Group” was made with ARC members to participate in the Battle of Qingdao against Germany. Like their previous practices, the “Naval Air Group” conducted reconnaissance and bombing. The task finished with neither major accidents nor groundbreaking accomplishments.²⁶

A more clear understanding about the tactical role of aircraft appeared among the aviation

¹⁸ *ibid.*

¹⁹ 日本海軍航空史編纂委員会、1969、『日本海軍航空史 制度篇』、時事通信社、7頁、10頁

²⁰ 防衛省防衛研究所、『松永寿雄史料』、5 航空関係—全般— 127

²¹ *ibid.*

²² 日本海軍航空史編纂委員会、1969、『日本海軍航空史 用兵篇』、時事通信社、54頁；和田秀穂、1944、『海軍航空史話』、明治書院、41頁

²³ 「大正2年 公文備考 卷18 学事3 航空術研究会(1)」、JACAR (アジア歴史資料センター) Ref. C08020254500、(防衛省防衛研究所)

²⁴ 「大正2年 公文備考 卷18 学事3 飛行作業表(1)」、JACAR (アジア歴史資料センター) Ref. C08020254800 (防衛省防衛研究所)

²⁵ 水交会、『水交会記事』、1914、第12巻第1号、12-16頁

²⁶ 和田秀穂、『海軍航空史話』、25-30頁

pioneers in January 1916, when Capt. Yoshida Kiyokaze, chairman of the AMC at that time, submitted a report to the Naval Minister. After reviewing the short history and status quo of—or in other words, summarizing all the Japanese knowledge about—naval aviation, the report put that “aircraft should not only be used for reconnaissance, but also for attacks gradually in the future”²⁷ as one of its lessons learnt. It was for the first time that such understanding of the combat role of naval aviation was stated formally and clearly.

With the Imperial Diet’s approval, the ARC was transformed into the first air group in the IJN—the Yokosuka Naval Air Group(横須賀海軍航空隊)—on Apr. 1st, 1916. Just a few days before, Capt. Yamauchi Shiro, a senior member of the AMC and the first commander of this new air group, had submitted a report about his inspective trip on aviation around Europe and America, which also summarized that bombing should be the primary function of aircraft.²⁸

From June 1912 to March 1916, the ARC nurtured the first batch of aviation professional officers for the IJN, providing the IJN with qualified staff officers on aviation issues, and instructors that trained those who further changed Japanese naval aviation later. Meanwhile, including Capt. Yamaji and Lt. Cdr. Yamamoto, a few staff officers in the Naval Ministry and Naval General Staff also became familiar with aviation. These two small groups of people composed the aviation pioneers in the IJN. With a belief in aircraft’s potential against surface vessels,²⁹ they were to play an essential role in promoting such an understanding in the whole navy.

3.2 RN’s First Knowledge about Aviation: 1907-1918

In Britain, although the RN had an encounter with aviation earlier than the IJN, it had not paid much attention to this new technology. In 1907, the Admiralty showed disinterest toward Wright Brothers’ “flying machine”.³⁰ Three years later, RN eventually accepted the offer of a civilian pilot named Frank McClean to gratis train four naval officers to fly, which received more than 200 applications from naval officers.³¹ In February 1912, the Royal Navy opened the Eastchurch Flying School commanded by Samson, one of the four trainees.³²

²⁷ 「大正 5 年 公文備考 卷 21 学事 2 航空術研究委員報告 (2)」、JACAR (アジア歴史資料センター) Ref.C08020758500、(防衛省防衛研究所)

²⁸ 「大正 5 年 公文備考 卷 22 学事 3 航空に関する視察報告 (1)」、JACAR (アジア歴史資料センター) Ref.C08020758900、(防衛省防衛研究所)

²⁹ 桑原虎雄、1964、『海軍航空回想録 草创編』、航空新聞社、25-26 頁

³⁰ Christopher Shores, *100 Years of British Naval Aviation*, Haynes Publishing, California, 2009, p11

³¹ Philip Jarrett, *Frank McClean: Godfather to British Naval Aviation*, Seaforth Publishing, 2011, P60-61

³² Eric Grove, “Seamen or Airmen? The Early Days of British Naval Flying”, in Tim Benbow ed., *British Naval aviation: the First 100 Years*, King’s College London, UK, 2011, p14; Philip Jarrett, *Frank McClean*, p62, pp77-

Staff of that school also composed the Naval Wing of a new “Royal Flying Corps” established by the decision of the Committee of Imperial Defence.³³

In August 1912, on accepting the appointment of Director of Aviation Department recently established within the Admiralty,³⁴ Capt. Murray Sueter predicted 8 duties of the naval wing, indicating that it had been impossible to predict exactly what aircraft could best do at this stage. Capt. Sueter’s list was topped by “distant reconnaissance with the fleet” and “reconnaissance of enemy coasts from detached cruisers or special aeroplane ships”, while tasks related to attack and defense came at the end.³⁵ In the Royal Navy annual maneuver in 1913, aircraft participated for the first time, focusing on reconnaissance.³⁶

Just like what happened in Japan, the Naval Wing first started with some experimental work. According to a supervising report issued in June 1913, such experimental work had been dealing with engines, wireless telegraphy, control of naval aeroplanes, bomb-dropping, launching torpedoes, firing practice and inspection of aircraft construction.³⁷ As the WWI was approaching, pioneer aviators proposed for exercises with aircraft attacking submarine,³⁸ experimented to destroy German Zeppelins in the air, “to devise a bomb sight”, to learn “the effects on an aircraft of the release of a 100-lb. bomb” and “the consequences of flying over an explosion”, to detect submarines and to devise deep bombs against them.³⁹ On March 19th, 1914, Sueter recommended to build a torpedo carrying seaplane.⁴⁰ Such flexibility resulted in the multiple tasks including air patrol and air defence/attack allocated to the new air service when the hostility commenced.

However, British naval aviators learnt more from WWI than their Japanese colleagues. In the autumn of 1914, after finishing a job of providing support for a Royal Marine brigade sent to hold Antwerp, the ardent Cdr. Samson and his squadron (later renamed Royal Naval Air Service, or RNAS) decided to stay in the frontline⁴¹ and finally extracted an order from the Admiralty requiring them to preventively defend Britain against Zeppelins and

78; Arthur Durham Divine, *The Broken Wing : a Study in the British Exercise of Air Power*, Hutchinson London, 1966, p26

³³ Malcolm Cooper, *The Birth of Independent Air Power*, Allen&Unwin London, 1986, p7

³⁴ *ibid*, p8

³⁵ Eric Grove, “Seamen or Airmen? The Early Days of British Naval Flying”, p20

³⁶ A.Hezlet, *Aircraft and Sea Power*, Davies, 1970, p17

³⁷ CAB. 38/24/21, from S. Roskill ed., *Documents Relating to the Naval Air Service, 1908-1918*, the Navy Records Society, 1969, pp100-101

³⁸ Longmore Papers, from S. Roskill ed., *Documents Relating to the Naval Air Service, 1908-1918*, p126

³⁹ Divine, *The Broken Wing*, pp42-43

⁴⁰ Murray Sueter, *Airmen or Noahs*, Sir Issac Pitman&Sons Ltd., 1928, p420

⁴¹ A.Hezlet, *Aircraft and Sea Power*, p25

submarines.⁴² According to this, air raids against Zeppelin bases were conducted.

Bombing remained on the task list of Cdr. Samson. In Feb. 1915, he sent a letter to the Admiralty asking for “a large number of aeroplanes” “with speed of about 90 miles per hour or more, and carrying 300 lb. weight of bombs”. He believed that “bomb-dropping is only successful at the present moment when carried out by aeroplanes carrying a number of bombs”, and it was best to keep a load of bombing at the ports of Dunkirk so that submarines would not be able to use them.⁴³ Later in the Dardanelles, an RNAS officer conducted the first successful aircraft torpedo attack against a vessel in history.⁴⁴

Bombing also became a topic in the Admiralty. Minutes of a conference among Churchill (the First Lord) and several aviation pioneers (now occupants of crucial posts in the RNAS) on 3rd April 1915 showed that “aeroplanes and seaplanes” for the duty of “bomb dropping and offensive raids generally” appeared on the top of the agenda, followed by “reconnaissance” and “spotting for gun fire”.⁴⁵ The faith in bombing continued even after the failure of the operations in the Dardanelles.⁴⁶ At the end of 1915, with the new torpedo aircraft available, Sueter produced a paper to advocate that these new machines “would have a similar potential to transform naval warfare as the tank had done with warfare on land” by attacking hostile fleets in group from a distanced base. Regrettably, Sueter’s plan did not work because of bad weather and the problems of these new aircraft.⁴⁷

Even in the post-Churchill disturbances in the Admiralty surrounding the administration of the RNAS, there still seemed a silver lining of the Royal Navy accepting the role of aircraft as a weapon. In 1916, answering to the query of the Joint War Air Committee, the RNAS listed five major tasks “such as can best be carried out by personnel with naval training”, first of which was “to attack the enemy’s fleets, dockyards, arsenals, factories, air sheds, etc., from the coasts, whether the coasts be the enemy’s or our own (i.e. long-distance bombing),” followed by patrol, gunfire spotting, scouting, and assisting the Army.⁴⁸ In fact, such statements were rather close to actual functions of naval aircraft in WWII. In August, 1917, the Assistant Director of Air Services, Wing Captain A.V. Vivyan, who had been the first commander of the first British seaplane carrier HMS *Hermes*, drafted a report asking

⁴² Eric Grove “Air Force, Fleet Air Arm- or Armoured Corps? The Royal Naval Air Service at War” in Tim Benbow, ed., *British Naval Aviation*, p31

⁴³ C.R.Samson, *Fights and Flights*, Hazell, Waston & Viney Ltd, 1930, pp191-193

⁴⁴ Christopher Shores, *100 Years of British Naval Aviation*, pp35-36

⁴⁵ Adm1/8497, from S. Roskill ed., *Documents Relating to the Naval Air Service, 1908-1918*, p195

⁴⁶ Air 1/1207, “Report on the Performances of No.1 Wing R.N.A.S during 1915”, quoted from S. Roskill ed., *Documents Relating to the Naval Air Service, 1908-1918*, p262-266

⁴⁷ Eric Grove, “Air Force, Fleet Air Arm- or Armoured Corps?”, p44-p45

⁴⁸ Cooper, M., *The Birth of Independent Air Power*, HarperCollins, 1986, pp46-49

for “three types of aircraft to operate with the fleet: reconnaissance, fighters and torpedo bombers, with different carriers for each type”. He recommended the newest and fastest aircraft carrier, once commissioned, to carry bombers and to operate with the fleet.⁴⁹ In September, Admiral Beatty, C-in-C of the Grand Fleet, asked the Admiralty for a “heavy air attack on the High Sea Fleet with 120 of the new torpedo bombers launched from eight carriers”.⁵⁰ Though these calls were not fully supported by the Admiralty, it was clear which direction the British naval aviation would be heading.

4. Diffusion of New Understanding in Two Navies

4.1 Japan: Intercommunications between the Aviation Pioneers and Naval Centrals

In Japan, the understanding that aircraft should be used as a weapon, which was commonly held in naval aviation pioneers, had been successfully diffused to the whole IJN through intercommunications between aviation pioneers and naval centrals. There were two ways of these intercommunications, one was through committees who participated by members of these two groups, and the other was aviation pioneers joining the naval centrals through personnel shifts.

First, in order to better understand the aircraft, the IJN organized several informal committees since 1917. Aviation pioneers participated actively in these committees, and most decisions taken by these committees agreed that aircraft should best be used as a weapon.

For example, in November 1917, a Temporary Investigative Committee on Submarine and Aircraft Affairs (TICSA, 臨時潜水艦航空機調査会) was established in response to a report of the Director General of the 1st Dept. (department of operations) of the Naval General Staff, which argued that due to the rapid technological progress in Europe since the Great War had broken out, a unified research & planning institution on submarine and aircraft affairs under the direction of the Naval Minister should be established as soon as possible.⁵¹ The research topics of the TICSA on aviation included organization, equipment, personnel training, “offensive/defensive methods” and “other necessary issues”.⁵²

Seen from the name list remaining, aviation pioneers played a critical role in the committee. Capt. Yamauchi and Cdr. Kaneko were both “full-time members” of the committee’s aviation department. The TICSA produced 8 reports on aviation in total. A

⁴⁹ R.D. Layman, “Naval Aviation in the First World War : its Impact and Influence” in Tim Benbow ed., *British Naval Aviation*, p49

⁵⁰ *ibid.* p50

⁵¹ 『日本海軍航空史 制度篇』、20-22 頁

⁵² *ibid.*

report on aircraft carrier pointed out that the most essential quality of aircraft carriers should be the ability to carry as many aircraft as possible, and attack aircraft should be most often carried on the carrier.⁵³ Another report in October 1918 proposed that two-thirds of the aircraft production should be undertaken by civilian enterprises instead of military factories so that the quantitative need of aircraft could be met.⁵⁴ Seen from the emphasis on the number of aircraft, the thought hold by Capt. Yamauchi and Cdr. Kaneko that aircraft should be primarily used as weapon⁵⁵ was likely to be accepted by other members in the TICSA.

Aviation members in TICSA also promoted for setting up aviation related institutions in naval central authorities. Their wish list included a separate branch in the Bureau of Military Affairs (BMA), a naval aviation department which answers to the Naval Minister directly, and a Cdr./Lt.Cdr. staff officer in Naval General Staff.⁵⁶ Although the latter two on the list had to wait until 1927 and 1922, the first came true in July 1919 when the TICSA was dismissed and separated to two temporary branches of BMA on aviation and submarine respectively.⁵⁷ With the autonomy of this new born Branch of Aviation, Lt.Cdr. Oseki Takamaro submitted a report in June 1919, arguing that “Aviation force of the IJN should participate in fleet battles as a critical part cooperating with capital ships by directly attacking the enemy fleet.”⁵⁸

Another example of such committees was the Naval Aviation Investigative Committee (海軍航空調査会) established in 1923 to “better coordinate the administration, operation, technology and other areas of aviation” and “provide solutions for aviation related problems”. Chaired by a rear admiral with full seniority, this committee was staffed with naval officers from key naval central departments, as well as Oseki and some pioneer aviators.⁵⁹ With “fierce debating at every group review”⁶⁰, this committee made the critical decision to conduct bombing experiments against an old battleship *Iwami* in August 1923,⁶¹

⁵³ 「臨航潜-航-機密第 16 号 飛行機母艦に関する件」、『和田秀穂史料』、防衛省防衛研究所、5 航空関係一全般一126

⁵⁴ 「臨航潜-航-機密第 16 号 航空機製造機関に関する件」、『和田秀穂史料』、防衛省防衛研究所、5 航空関係一全般一126

⁵⁵ Capt. Yamauchi's understanding of aircraft is mentioned above. As for the attitude of Cdr. Kaneko, see 和田秀穂、『海軍航空史話』、47 頁

⁵⁶ 「大正 8 年 公文備考 卷 36 航空 1 一般航空 (5)」、JACAR (アジア歴史資料センター) Ref.C08021349000、(防衛省防衛研究所)

⁵⁷ 『日本海軍航空史 制度篇』、79 頁

⁵⁸ 「大正 8 年 公文備考 卷 40 航空 5 止諸報告 (8)」、JACAR (アジア歴史資料センター) Ref.C08021355900、(防衛省防衛研究所)

⁵⁹ 『日本海軍航空史 制度篇』、85-88 頁

⁶⁰ *ibid*, p88

⁶¹ 「米航空隊の軍艦爆撃試験」、『朝日新聞』、東京 1921 年 9 月 21 日 夕刊 1 頁；「米航空隊の艦艇爆撃演習、絶大なる成績」、『朝日新聞』、東京 1921 年 11 月 14 日 朝刊 6 頁

an attempt to test the new American findings that aircraft could bombard and sink battleships, which caught the eye of many in Japan,⁶² by the IJN itself. The experiment was conducted in July 1924 with the endeavors of the whole IJN, receiving much attention.⁶³ With the battleship sunk with less ammunition than expected and the hit rate flat comparing with that of other navies and the IJN's previous training, results of the experiment did support pioneer aviator Lt.Cdr. Matsunaga Toshio, one of its participants' persuasive argument that the aircraft had shown potential to become an important naval weapon in the future, and more naval resource should be invested in it.⁶⁴

Second, besides participating committees, aviation pioneers in IJN also had other chances to take posts in naval centrals. For example, Yamauchi had once led the Aircraft Section of the Naval Technological Department; Kaneko had also worked in the Naval Ministry and the Naval College. Lt.Cdr. Matsunaga himself had been transferred to the BMA in June, 1926, and two months later, the BMA listed "bombing and torpedo dropping by aircraft" in the Plan of Naval Drill 1926 as a separate program for the first time.⁶⁵ The performance of aircraft in the drill also supported the decision to set up a Naval Aviation Department in 1927.⁶⁶

From 1925, torpedo bombing emerged as a training subject for the Yokosuka Naval Air Group.⁶⁷ Seen from the training subjects issued every year from 1927, the air arm of the IJN worked on tactical aspects including firing, bombing, torpedo-bombing, reconnaissance, maintenance, etc. The hit rate of bombing and torpedo bombing was a constant focus.⁶⁸ In 1928, an IJN official doctrine book, *The Third Revision of Principles in Naval Operations* defined the aim of naval air operations as "attack the hostile main fleet in assistance of friendly fleet",⁶⁹ marking the acceptance of aircrafts' combat role in the whole IJN.

4.2 Britain: Organizational Barriers and Stagnated Change

Unlike what happened in Japan, the independence of the Royal Air Force in April, 1918 resulted in barriers for the intercommunications between naval aviation pioneers and the naval centrals. First, since most naval aviation pioneers left the RN for the RAF, they were

⁶² 「海軍航空調査会 大正十二年八月十五日主査会決議」、『和田秀穂史料』、防衛省防衛研究所、5 航空関係—全般— 126

⁶³ 『松永寿雄史料』、防衛省防衛研究所、5 航空関係—全般— 127、

⁶⁴ *ibid.*

⁶⁵ 「公文備考 検閲 演習 1 卷 63 大正 15 年度海軍小演習に持設すべき事項其の他に關する件 (1)」、JACAR (アジア歴史資料センター) Ref.C04015261300、(防衛省防衛研究所)

⁶⁶ 『松永寿雄史料』、防衛省防衛研究所、5 航空関係—全般— 127

⁶⁷ 『日本海軍航空史・用兵篇』、503 頁

⁶⁸ *ibid.*、608-634 頁

⁶⁹ 『戦史叢書・海軍航空概史』、26 頁

not possible to participate in the work of the naval centrals. Second, since the RAF central was not interested in the naval use of air force, naval aviation pioneers could neither promote their new understanding about using aircraft as a weapon within the RAF. Third, RAF leadership also confined the naval aviation pioneers in the RAF from direct interchange with the naval central, making them unable to promote their new understanding in the RN. Thus, the understanding about the new tactical role of naval aircraft failed to be diffused.

From the establishment of the RAF on Apr. 1st 1918, the management of naval aviation had been split between the new service and the Royal Navy. Naval aircraft and most aviators belonged to the RAF Coastal Area, to which a few naval officers were “seconded” as pilots or observers in order to provide the Royal Navy with some basic knowledge about aviation. In the Admiralty, there remained only a very small Naval Air Section.⁷⁰

In 1924, the Fleet Air Arm (ship-based aircraft) was established within the RAF Coastal Area (renamed as Coastal Command in 1936) and the Royal Navy was allowed to provide for 70% of its pilots and all the observers, while the aircraft was provided by and thus belonged to the RAF. However, for almost a decade the highest rank an FAA naval aviator could reach was lieutenant, commanding normally 6 aircraft, a post too junior to gain enough vision on how best to use aircraft operationally, not to say strategically.⁷¹

The majority of naval aviation pioneers who went to the new service including Samson and Vivyan soon found that the Air Staff was not considering much about using aircraft for naval purposes. Air Marshal Hugh Trenchard, the Chief of the Air Staff from 1919 to 1930, was more interested in strategic bombing of industrial centers⁷² and insisted on the “ubiquity” of the air service.⁷³ The Deputy Chief of Air Staff provided by the Royal Navy at the beginning of the new service, ex-RAdm. Mark Kerr, who had supported the independence of the RAF for the value of aircraft in anti-submarine duties, left the post for an RAF Area Command in April 1918 because of “certain differences on matters of strategy with the Chief of the Staff”⁷⁴ and soon retired. Ex-Fifth Lord Godfrey Paine, the other crucial figure in the Air Council from the Royal Navy, remained Master General of Personnel, held but limited responsibilities, and “the remainder of the Council did not recognize that anti-submarine warfare was of the first importance for the safety of our

⁷⁰ ADM186/63, *Instructions for Naval Staff*, Ken, British National Archives

⁷¹ David Hobbs, *A Century of Carrier Aviation: The Evolution of Ships and Shipborne Aircraft*, Naval Institute Press, 2009, pp132-134

⁷² Phillip S. Meilinger, "Trenchard and 'Morale Bombing': The Evolution of Royal Air Force Doctrine before World War II." *Journal of Military History* 60 (1996): 243-270

⁷³ ADM234/383, *Development of British naval aviation 1919-1945: Volume I*, p17, National Archives

⁷⁴ Mark Kerr, *Land, Sea and Air*, Longmans, Green and Company, 1927, pp293-294

communications and supplies”.⁷⁵

It was neither easy for naval aviation to find representation in the Naval Staff, in which a small new Naval Air Section (single staffed for six months) was established and headed by the only pioneer aviator who remained in the Royal Navy, Richard Bell Davies. However, his work was under the close supervision of the Assistant Chief of Naval Staff and with little autonomy.⁷⁶ His attempt to cooperate with RAF Coastal Area raised protest from the Air Council as trespass,⁷⁷ then banned with the concurrence of RN centrals and the reaffirmation from the Prime Minister in 1926.⁷⁸

Moreover, Davies himself was not as passionate as his Japanese counterparts in the value of naval aircraft. On the bombing trials conducted by the RN and the RAF against the battleship *Agamemnon* in 1923, Davies was unwilling to accept the idea that aircraft may destroy battleships, since such a situation would severely deteriorate the security surroundings of Britain and reduce the value of the RN fleet in national defense against land-based German aircrafts.⁷⁹ In his remarks, the trials were less arbitration between bombs and battleships than a message to the public about the unlikeliness of saving defense expenditures by replacing battleships with aircrafts.⁸⁰ Thus, though the results of these trials were similar to those in Japan and the United States,⁸¹ they received much colder reactions in Britain and did not lead to a major shift in the Royal Navy’s understanding of aircraft.

In summary, although the naval aviation pioneers in Britain formed the new idea that aircraft should be used as a weapon to attack in their practices, the organizational barrier established between most naval aviation pioneers and the naval leadership after the independence of the RAF blocked the new idea from being accepted by the whole navy. The result could be seen from the *Naval War Manual 1925*, which mentioned “the strategic function of aircraft” equivocally as “independent operations against the enemy” but emphasized the “tactical functions of naval aircraft in naval battles” topped by reconnaissance.⁸²

⁷⁵ *ibid.*

⁷⁶ Robert Davies, *Sailor in the Air: The Memoirs of the World’s First Carrier Pilot*, Seaforth Publishing, 2008, p193

⁷⁷ *ibid.*, p191

⁷⁸ Till, *Air Power and the Royal Navy*, p41

⁷⁹ Davis, *Sailor in the Air*, p205

⁸⁰ *ibid.*

⁸¹ P.K Kemp, *Fleet Air Arm*, London: Herbert Jenkins, 1954, p110

⁸² ADM186/66, *Naval War Manual*, National Archives

5. Conclusion

This article tries to argue that in both countries, knowledge about the optimal tactical role of naval aircraft was first accumulated in a small group of “aviation pioneers”. In Japan, such new idea was successfully promoted by these pioneers to the whole navy through committees and personnel shifts. However, similar pattern failed to complete in Britain after the independence of the Royal Air Force (RAF) in 1918, largely because organizational barriers established between naval aviation pioneers who did know about the best use of naval aircraft and those in the RN centrals.

At the very beginning of naval aviation, both the IJN and the Royal Navy organized a small branch of young officers to explore this new area, who gradually found that the primary role of aircraft in naval battles should be a weapon against hostile targets in their highly autonomic training, experiments and operations.

In the IJN, such an idea was gradually promoted by these aviation pioneers and finally accepted. Japanese naval aviation pioneers participated actively in the process of related decision making through discussions and cooperation with officers of naval centrals. The connection between naval centrals and aviation pioneers was kept tight through institutional links and personnel shifts. Thus, despite the relative weakness of aircraft in the 1910s and the early 1920s, and the belief in battleships held by many IJN officers out of aviation area, aircraft was still accepted by the IJN as a weapon explicitly in 1928.

In Britain, the understanding of aircraft as a naval weapon also started gradually diffusing from the aviation pioneers up to officers of naval centrals and commanders of naval forces. However, with the establishment of an independent air force, organizational barriers between the aviation pioneers and naval/air force centrals interrupted the communication of ideas and blocked the diffusion of new understanding. On one hand, naval centrals, who needed to know about the tactic role of naval aircraft, could not satisfyingly communicate with the aviation pioneers who did know about the situation. On the other hand, the RAF centrals who had access to naval aviation pioneers and the knowledge were not interested in the naval use of aircraft. Thus, the value of aircraft as a weapon at sea was blurred in both services. The new naval tactical role of aircraft was not recognized in Britain in *the Naval War Manual 1925*, not even in *the Manual of Combined Operations 1938*.⁸³

These similarities and differences in the process of understanding the role of aircraft in naval power indicate that the effectiveness of military organizations to learn new technologies is related to the properties of these organizations. Instead of learning new technologies as a whole, military organizations tend to begin learning with a small group of

⁸³ ADM186/66, *Naval War Manual*; ADM186/117, *Manual of Combined Operations*, National Archives

autonomous pioneers, whose acquired knowledge taken into the whole organization later. With a smooth channel of ideational exchange between the group of pioneers and the original organization, military innovations would be more effective.

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