

Convertibility and the Militaristic Perversion of Aviation in Disarmament Discourses, 1919-1945[†]

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The interwar years mark the emergence of arms control both as a major foreign policy issue and also as a major topic of public and private debate and discussion in Europe and elsewhere. This paper examines two prominent, yet neglected, aspects of these discourses. Unearthing and exploring these two aspects points to the importance of assumptions about the nature and origins of science and technology in discourses surrounding arms control, as well as the politically contingent nature of many of the concepts used therein. The first aspect, the possibility of the convertibility of civilian science and technology to military use, was debated and discussed in relation to a wide range of industries, particularly aviation. This paper shows that although convertibility was used to support widely different positions in relation to arms control, arguments for its support rested on the same shared assumptions about the relationships between civilian and military technologies. The second aspect was a ‘militaristic perversion’ argument which sometimes built upon the first, often by internationalists and pacifists. The natural development of modern science and technology was a civilian one, it was argued, which would lead to beneficial effects including increasing peace and prosperity and even, in some cases, international integration. The military application was, on the other hand, a perversion which had twisted these sciences and technologies into an unnatural and harmful trajectory. This argument was used most often in support of reduced arms production and deployment, and for reduced military influence in certain industrial sectors.

The interwar years mark the emergence of arms control both as a major foreign policy issue and also as a major topic of public and private debate and discussion in Europe and elsewhere. Elected government officials, politicians, diplomats, activists, pressure groups, and the press participated in discourses that discussed the nature and feasibility of different forms of arms control, and their relationship to foreign policy, military objectives, and international relations more broadly. These disarmament discourses present rich sites for the investigation of beliefs about science, technology, and modernity. They span both public rhetoric and private policy discussion, and when located within the context of international negotiations they incorporate a range of different political positions and counterarguments. Moreover, as disarmament has often been an important concern for

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those creating or enacting foreign policy, for intellectuals thinking about international relations, and for activists pushing for (or against) greater pacifism or internationalism, these discourses incorporate ideologically charged positions and rhetoric. These discourses, then, can lay bare ideological positions and so help us to understand political ideologies and belief systems, and give us a window to assumptions about (in this case) science, technology, and industry held more widely in society.

This paper examines two prominent, yet neglected, aspects of these discourses. The first, the possibility of the convertibility of civilian science and technology to military use, was widely debated and discussed in relation to a wide range of industries, particularly aviation. Discussions on convertibility incorporated differing understandings of the extent to which it was possible, reached a variety of conclusions as to its implications for defence policy and arms control, and were used to support differing, sometimes diametrically opposed, positions on armaments and arms control. Yet arguments for convertibility everywhere rested on the same shared assumptions about the relationships between civilian and military technologies – that it was possible because modern military weapons had their origins in civilian science and technology, and had not yet diverged enough from their civilian counterparts to make conversion from civilian to military technology impractical. The second aspect was a ‘militaristic perversion’ argument which sometimes built upon the first, often by internationalists and pacifists. The natural development of these sciences and technologies was a civilian one, it was argued, which would lead to beneficial effects including increasing peace and prosperity and even, in some cases, international integration. The military application was, on the other hand, a perversion which had twisted these sciences and technologies into an unnatural and harmful trajectory. This argument was used most often in support of reduced arms production and deployment, and for reduced military influence in certain industrial sectors.

These aspects of the debates surrounding arms control are largely absent from the growing literature on interwar arms control, which has not unpacked notions of science and technology alluded to in these debates.¹ Yet recent work has demonstrated that the language of foreign policy can be fruitfully examined in order to unearth widespread conceptual understandings.² This paper seeks to do exactly this by building on the cultural histories of aviation produced by David Edgerton and Brett Holman, and extending their insights by arguing that assumptions about science and technology were central to notions of aerial convertibility, that convertibility arguments often went hand-in-hand with militaristic perversion arguments, and that these notions were not peculiar to aviation but were widespread in relation to other industries.³ This paper places these two sets of arguments into a longer perspective by tracing them into the Second World War and to the United States, and through to the early postwar period. Unearthing and exploring these two aspects points to the importance of understandings and assumptions about the nature and origins of science and technology in discourses surrounding arms control, as well as the politically contingent nature of many of the concepts used therein.

¹ On arms control broadly, Ahmann, Birke, and Howard, *The Quest for Stability*; Webster, ‘From Versailles to Geneva’. On British policy, Richardson, *The Evolution of British Disarmament Policy*; Kitching, *Britain and the Problem of International Disarmament*; McKercher (ed.), *Arms Limitation and Disarmament*. On chemical weapons, Spiers, *Chemical Warfare*. On French policy, Vaisse, *Sécurité D’abord*; Jackson, ‘France and the Problems of Security’. On naval arms control, Hall, *Britain, America and Arms Control*; Kaufman, *Arms Control During the Pre-Nuclear Age*; Goldman, *Sunken Treaties*; Fanning, *Peace and Disarmament*.

² Doty, ‘Aporia’; Milliken, ‘The Study of Discourse in International Relations’; Larsen, *Foreign Policy and Discourse Analysis*.

³ Edgerton, *England and the Aeroplane*, p. 41; Holman, ‘The Shadow of the Airliner’.

I Aerial Convertibility

Although discussion on the military uses of aviation predated the First World War, the notion that existing civilian aircraft and associated facilities could easily be converted to military use emerged in Britain at the end of the war in relation to state planning for postwar aviation. Citing the apparent success of military aviation during the war, the convertibility argument was used in support for calls for an expanded British air force and funding for British civil aviation. One government committee, charged ostensibly with suggesting policies for civil aviation after the war, suggested that the future development of civilian aircraft keep military uses in mind, even if this reduced commercial profitability.⁴ In late 1918 Chief of the Air Staff Brigadier-General Frederick Sykes, in his so-called Sykes Memorandum on the future of British aviation recommended high subsidies for the British commercial aviation sector due to its usefulness for British military aviation. As well as the development of an extensive network of air routes and aerodromes, he recommended that British airliners be equipped so that they could be converted at short notice into bombers.⁵ Supporters of a strong British air force continued to argue for strong state support for civilian aviation in the 1920s and 1930s because civilian aviation offered, in the words of Air Commodore R.H. Clark-Hall lecturing at the Royal United Service Institution in 1924, a 'reserve' for military aviation.⁶ Underlying much of this rhetoric was the notion that civilian and military aviation were fundamentally the same, or derived from the same root. For Clark-Hall, for example, civil and military aviation were 'two branches' of one aviation. He ended his 1924 lecture by arguing that this aviation would develop in a unified way through three phases, and briefly outlined how five other similar 'inventions', the railway, the steamship, the telephone, the submarine cable, and the motor-car had passed through a similar three stage development. These technologies were chosen as they were generally then considered to be of the same type, that is civilian transport and communications which had the effect, fundamentally, of increasing the speed of communications. The militaristic aspects of these technologies were not mentioned at all.⁷ The intimate connection between military and civil aviation was built on the widespread assumption that military aviation was civilian in origin, though developed along military lines by the armed forces. This assumption was widely believed and reproduced in writings on aviation – as in, for example, Walter Raleigh's 1922 official history of wartime aviation, which began with a history of the 'invention' of aviation and highlighted heroic civilian inventors as the progenitors of military aviation.⁸

Civilian aerial entrepreneurs and industrialists also made the reserve argument as part of their calls for greater state support for civilian aviation. In 1920 the self-styled 'First Air Member of Parliament' Noel Pemberton-Billing called for further funding of an 'efficient commercial air service' on the basis that this would give Britain 'an enormous reserve to call upon at any time'. Speaking in Parliament, Pemberton-Billing called not only for greater subsidies for the civilian aircraft industry, but also for suggested greater state regulation which would ensure the design and production of civilian aircraft that could be

⁴ Holman, 'The Shadow of the Airliner'.

⁵ Sykes, 'Memorandum by the Chief of the Air Staff'. See also, Sykes, *Aviation in Peace and War*, pp. 102-4.

⁶ Clark-Hall, 'The Value of Civil Aviation as a Reserve'.

⁷ *Ibid.*

⁸ Raleigh, *The War in the Air*, p.122.

‘transformed into bombing machines at short notice’.⁹ Others, such as the aerial entrepreneur and Member of Parliament Charles Dennistoun Burney argued that the state should fund international commercial aviation instead of military aviation. This would be both stimulate economic demand whilst at the same time providing a military reserve.¹⁰ Christopher Birdwood Thomson, onetime Labour Air Secretary, was one of many who called for the inculcation of an ‘air habit’ amongst the public so as to bolster civil aviation and provide a pool of expertise for military aviation.¹¹

The convertibility argument was used in support of increased funding for British aviation in other ways too. In the twenties and thirties it was used to warn of the dangers of German aviation - most prominently in the writings of air power enthusiast Brigadier General (retired) P.R.C Groves and the newspapers which promoted his views. In lectures and newspaper and journal articles Groves warned that Germany was developing her civilian aviation in such a manner that their civilian aircraft could be used for military purposes, including bombers, if required.¹² But he also located this potential for conversion within the broader natural technical development of large civilian aircraft. His much publicised 1927 report to an Air Transport Co-operation Committee of the League, *The Relations between Civil and Military Aviation*, pointed out that: ‘The development of commercial aviation has called for a constantly increased range of greater reliability, greater weight and carrying capacity and higher speeds. These are precisely the requirements aimed at in the development of bombers...The average air liner is a potentially far more efficient bomber than the air liner of seven years ago’.¹³ More broadly the fear of a German aerial attack in the 1930s included the notion that Germany could use commercial aeroplanes as bombers. One RAF officer, writing in *The Spectator* in 1935, estimated that Germany had 300 ‘modern’ civilian aeroplanes with ‘a real military value’, along with a network of commercial aerodromes and facilities suitable for military use. The British state, contended these supporters of air power, needed to invest more civilian and military aviation in turn, or risk quick defeat in a future war.¹⁴

Given national and nationalist concerns about aerial power, it is no surprise that convertibility became an important component of debates about aerial disarmament. It cropped up at the post-World War One Paris peace conference during debates on the disarmament regimes to be imposed on Germany. In 1919 the notion of convertibility was readily accepted by both those arguing for and arguing against tight restrictions on German aviation. One French delegate called for a ban on all German civil aviation for twenty to thirty years. The opposing response, by the U.S. Secretary of State Robert Lansing, compared abolishing Germany’s civil aviation to depriving her of horses, which could draw both ploughs and guns. President Wilson pointed out that by the same logic railroads, which could carry armaments, and merchant ships, which could readily be converted for war use, should be banned too. The Allied aeronautical commission charged with drawing up the aerial sections of the Treaty of Versailles concluded that, in addition to restricting German military aviation, civil aviation needed to be restricted because of its convertibility (‘aeroplanes and airships can be very easily and quickly transformed into weapons of

⁹ *Hansard* (Commons), 5th ser., CXXXVI, 11 Mar. 1920, col. 1658.

¹⁰ *Hansard* (Commons), 5th ser., CCIII, 17 Mar. 1927, cols. 2248 – 59. See also: *Hansard* (Commons), 5th ser., CCXXXVI, 7 Mar. 1929, col. 670; and Burney, *The World, The Air and the Future*.

¹¹ Thomson, *Air Facts and Problems*, p.58.

¹² Groves, *Our Future in the Air*; Groves, *Behind the Smoke Screen*, pp. 230, 237; Holman, ‘The Shadow of the Airliner’.

¹³ Groves, ‘The Relations between Civil and Military Aviation’.

¹⁴ P.R. Burchall, ‘Civil Aviation and Bombing’, in *The Spectator*, 7 June 1935, p. 968.

war').¹⁵

Opponents of aerial disarmament used the convertibility argument too in the 1920s. The Air Ministry and air power enthusiasts in Britain cited it as a way of demonstrating that the complete abolition of bombers would not prevent bombing, and consequently that any attempt at such abolition would have to take civil aviation into account as well. This, the argument usually proceeded, was practically difficult and would retard the natural and beneficial growth of civil aviation. Aerial disarmament, they concluded, was thus not practically possible.¹⁶ A committee appointed by the League of Nations Preparatory Commission for the Disarmament Conference to consider the relationship between civilian and military aviation, for example, reached this conclusion following a series of meetings in February 1927. The Committee emphasised the importance of the continued development of civil aviation to international relations which, it noted, 'when it has reached its full development, will be one of the most important means of bringing the peoples of the world nearer together. Distances will be reduced more and more, so that civil aviation, by enabling the different nations to maintain ever-closer mutual relations, will contribute largely towards the maintenance of good international relations and the preservation of world peace.' Yet the committee also believed that civil aviation could be easily converted to military use. Consequently, rather than aerial disarmament, it suggested each state manage its aviation sectors in order to reduce convertibility. States needed to segregate military and civilian aviation as much as possible, so that militaristic ends did not contaminate the development of civilian aviation. It was also suggested that states propel the development of their civilian aviation forward so that it diverged, in terms of its characteristics, from military aviation. Its final report recommended that 'every effort should be directed towards differentiating more and more clearly between civil and military aviation; in this way, civil machines will become capable of a maximum economic return and will become less and less useful for military purposes, and the activities of civil aviation can be developed in full freedom without being subordinated in any way to the military requirements of the different countries.' Concrete proposals included the suggestions that governments separate their departments dealing with civilian and military aviation, that civilian pilots not be required to undergo military training, that governments not subsidize civil aviation for 'strategic' purposes (only for 'economic and social purposes'), greater international cooperation in civilian aviation, and that governments 'refrain from prescribing the embodiment of military features in the construction of civil aviation material'. These points were eventually incorporated into the draft agreement that was put before the 1932 Disarmament Conference - the agreement which was brushed aside by the Tardieu Plan and later disarmament proposals.¹⁷

The recourse to convertibility arguments by both opponents and supporters of aerial disarmament continued into the thirties, and were particularly prominent during the 1932-34 Geneva disarmament conference. Opponents of aerial disarmament, such as the Air Ministry civil servant J.M. Spaight argued that it would not work because civilian aircraft were easily convertible to military use.¹⁸ The Air Staff's stance during the Geneva

¹⁵ *Foreign Relations of the United States 1919*, IV, (Washington, D.C., 1943), pp. 370-1; Supreme Council, 17 Mar. 1919; Carlton, 'The Problem of Civil Aviation in British Air Disarmament Policy'.

¹⁶ For example: TNA, Air Staff Memorandum on Limitation of Air Armament, AIR 5/360, Dec. 1923.

¹⁷ League of Nations, Air Commission of the Conference for the Reduction and Limitation of Armaments, IX, (Geneva, 1932), pp. 47 - 8, *Objective Study on The Internationalisation Of Civil Aviation*. On the 1932 conference see, Kitching, *Britain and the Geneva Disarmament Conference*; Davies, 'France and the World Disarmament Conference of 1932-34'.

¹⁸ Spaight, *An International Air Force*, p. 74.

conference was that civilian aircraft had to be taken into account in comparisons of national aerial might, and if that was done then Britain was seriously behind even countries such as France, which had eight times as many civilian airliners.¹⁹ Internationalists agreed that civilian airliners could be converted to bombers, and consequently suggested that civil aviation also be controlled by an international organisation such as the League of Nations. In making these arguments supporters of international control often took up elements of anti-German rhetoric from the twenties, warning that the Germans had were specifically developing their civilian aeroplanes as a military reserve.²⁰ Other opponents used convertibility arguments in less conventional ways. Industrialist Frederick Handley Page, for example, argued in a speech in 1933 that international control of civil aviation was not needed because European civil aircraft could not readily be converted to bombers. American airliners could, however, and so any scheme for international control in Europe would increase American might in the air.²¹

Although widespread, belief in convertibility was not unanimous: a few opponents of aerial disarmament explicitly argued against it. Major Frederic Robertson, air correspondent for the *Manchester Guardian*, argued at a League of Nations Union conference on 'The Problem of the Air' in 1935 that aviation was, in fact, not a problem. Nations in the next war were likely to stick to the 'convention' of not bombing civilians, and that anyhow bombing by commercial aircraft was unlikely, for: 'if a plane is a good civil machine, it will be a bad bomber...Everybody says it is so easy to convert them. They are only thinking of putting a few bomb-racks underneath and a bomb-lever; but bombing is not as easy as all that. It is a very highly technical skilled operation...A lot of these civil machines could not fly high enough to be at all safe. They would not be manoeuvrable; and they would not be able to defend themselves against swift fighters.'²²

II Scientific and Industrial Convertibility

Convertibility arguments in relation to aviation were sustained in the twenties and thirties because they could be used effectively by supporters of national aviation, and by both supporters and opponents of aerial disarmament. But they were also sustained because they were used in relation to other armaments and industries, particularly naval and chemical armaments. In relation to naval arms convertibility arguments were most prominent during or in relation to the three prominent naval conferences: Washington 1921-22, Geneva 1927 and London 1930. During these conferences American arguments for a larger American navy in relation to the British drew on the notion that the larger British merchant marine provided a reserve which could be readily converted to military fighting ships. Convertibility arguments were used in the minutiae of negotiation - British insistence, for example, on restricting the mounting of eight inch guns on small American cruisers became a crucial sticking point at the 1927 Geneva Conference on naval disarmament. American resistance to this restriction came to rest on the argument that such cruisers would be only marginally superior to armed merchant ships.²³ The American press carried out a barrage of

¹⁹ Meilinger, 'Disarmament and Airpower'.

²⁰ For example, TNA, Arthur Henderson, Foreign Office Memo to the Disarmament Conference Subcommittee, *Disarmament Conference*, AIR 5/1117, 31 Mar. 1931. On international control see, Waqar Zaidi, "'Aviation Will Either Destroy or Save Our Civilization'"; Holman, 'The Shadow of the Airliner'.

²¹ Frederick Handley Page, 'Air Disarmament' in *Flight*, 6 April 1933, pp. 327-28.

²² League of Nations Union, *The Problem of the Air*, p. 18.

²³ Carlton, 'Great Britain and the Coolidge Naval Disarmament Conference'.

criticism of British proposals throughout the Conference, some of it based on the notion of the convertibility of Britain's merchant navy and its supporting infrastructure such as coaling stations. Commentators clamoured for this commercial infrastructure to be taken into account when calculating disarmament levels.²⁴ Opponents of naval disarmament made similar claims on the Senate floor and in Senate Committees.²⁵ Bemoaning the collapse of the Geneva Conference, British supporters of disarmament such as the academic Philip Noel Baker and political analyst Stephen King-Hall pointed out that the British government should have realised that military naval disarmament was in its best interest because such disarmament would have left it with the biggest potential military navy in the world – its own merchant fleet, ready to be improvised into 'battle fleet of armed liners capable of dealing with the combined fleets of Europe, if not of the world!'²⁶

Claims for convertibility in relation to chemical weapons arose, like for aviation, at the end of the First World War. Although the concept was used in discussions relating to German disarmament, its underlying function was to make the case for greater British state investment in the chemicals industry. A British Ministry of Munitions inspection of German factories in 1919 concluded that so many German civilian chemical factories could be or indeed had been converted to military use that German chemical disarmament was not possible without also abolishing several key chemicals industries, including her dye industry. This was, the inspection concluded, not possible, and so the only remedy for Britain was the 'establishment of a strong dye and fine chemical industry in this country so that, if necessary, we would be prepared to retaliate-in-kind'.²⁷ One proponent of disarmament announced in 1921 that the chemicals industry was 'the most perfect type of convertible industry', and a major task of Allied arms inspectors in 1920 was to ensure that military chemical factories were converted to civilian use. This belief in chemical gas convertibility continued through the 1920s and 1930s when it surfaced in discussions within the League of Nations and within the British government.²⁸ By the end of the twenties it had come to be closely intertwined with aerial convertibility. Aerial convertibility was referred to in discussions on chemical weapons, and vice-versa, in order to further emphasize that convertibility was the norm for these new scientific industries. Within the aerial discussions at the Preparatory Commission for the Disarmament Conference (1927-1930), for example, quick and easy convertibility of both the commercial aviation and chemical industries emerged as an unquestioned assumption accepted by all, even as they held differing views on disarmament itself.²⁹

Liberal internationalists were at the forefront of locating convertibility within a broader context of industry, science, and technology. In their treatises, books, and speeches on international relations and disarmament, convertibility emerged not as a peculiar characteristic of aviation, but rather as a peculiar characteristic of modern scientific industry. This allowed them to support their wider narratives on the unique destructiveness of modern scientific warfare and its destabilization of contemporary international relations.

²⁴ Edwin James, 'See American Loss in British Plan of Naval Disarmament' in *New York Times*, 12 May 1927; 'America May Insist on 9-Inch Naval Gun', in *New York Times*, 2 June 1927.

²⁵ Buckley, 'The Icarus Factor'. On interwar naval disarmament see also, Hall, *Britain, America and Arms Control*; O'Brien, *British and American Naval Power*, pp. 149-242; Fanning, *Peace and Disarmament*.

²⁶ Noel Baker, *Disarmament and the Coolidge Conference*, p. 37.

²⁷ Spiers, 'Gas Disarmament in the 1920s'.

²⁸ Shuster, *German Disarmament after World War I*, p. 66. Spiers, 'Gas Disarmament in the 1920s'.

²⁹ For example during discussions on aerial disarmament at the Preparatory Commission for the Disarmament Conference, see, Madariaga, *Disarmament*, p. 193. On reference to aerial convertibility in a work on chemical weapons see, Fradkin, 'Chemical Weapons – Its Possibilities and Probabilities'.

It allowed them to demand far-reaching solutions such as the creation of power international organisations and wide-ranging disarmament which extended into civilian industries. It also allowed them to claim that disarmament was now a more complex problem requiring apolitical technical expertise and radical solutions to resolve.³⁰ The widely read internationalist overview of international relations, Labour MP Hugh Dalton's 1928 *Towards the Peace of Nations*, pointed out that the 'swift and easy' convertibility of civilian to military aircraft was only part of a much bigger problem. Other prominent examples of convertibility were merchant ships and chemical factories, but these were also only part of a deeper pattern of industrial convertibility: 'In the long run and even, as was shown during the Great War, in the course of a year or two, almost the whole population and material resources of a State may be converted from peaceful occupations to purposes of war. For such wholesale conversions, highly industrialised communities possess great advantages.'³¹ In the leading scholarly work on disarmament of the 1920s, *Disarmament* (1926), Noel Baker argued that increasingly those modern scientific technologies that would play the most important role in war were precisely those also important in the civilian sphere. Consequently it was increasingly difficult to differentiate and delineate between outputs of modern science which could be used for military purposes, and those which could be used for civilian purposes. His three examples were, in order of importance, aviation, poison gas, and 'heavy motor-lorries'.³² Noel Baker and fellow internationalist David Davies believed that it was this modern breaking down of the previously firm divisions between civilian and military technologies, techniques, sciences and industries which made disarmament so difficult to negotiate. In a lecture on disarmament at the Grotius society in 1919 Davies warned that the 'aggressive powers of a nation do not necessarily depend on soldiers and warships. If both the latter were abolished, the most dangerous nation would be the possessor of the largest number of commercial aeroplanes, the greatest mercantile marine, or the best resources for the production of explosives and poisonous chemicals.'³³ Any workable scheme of disarmament would thus, these internationalists reasoned, also need to take into consideration related civilian industries.

Perhaps the best known and most systematic exposition of the convertibility argument in relation to disarmament was that by industrial chemist and chemical weapons expert Victor Lefebure. In a series of lectures, articles, and books in the twenties and early thirties he advocated a 'scientific' approach to disarmament which would both deal with the problems of modern industrial convertibility and correct for the failings of diplomats and politicians who, he claimed, were unable to systematically and dispassionately analyse the disarmament problem. Building on the widespread recognition that nature of modern warfare now rested on a country's industrial might, he emphasised the convertibility of civilian to military technologies and industries, especially in relation to chemicals and aviation, but then went on to argue for the existence of a 'conversion lag' - being the time taken to convert any particular civilian industry to military use. The existence of this lag, which varied from industry to industry and country to country, he reasoned, meant that the abolition or international control of whole industries and technologies was unnecessary. Disarmament regulations could instead focus on making conversion of civilian facilities to military armaments as difficult as possible. A scientifically determined mix of measures,

³⁰ On internationalist thinking on science and technology see: Zaidi, 'Liberal Internationalist Approaches to Science and Technology'.

³¹ Dalton, *Towards the Peace of Nations*, pp. 192-5.

³² Noel Baker, *Disarmament*, pp. 40, 41, 220-1.

³³ Davies, 'Disarmament'.

including supervision of research and development, limitations on technical and scientific personnel, and the banning of bombardment, would protect national civilian industries from immediate misuse by the state for military purposes.³⁴ His work was influential in internationalist and military policy circles, and was cited as support by both those who wanted disarmament and international control, and those who opposed it. It was also sometimes cited by those calling for increased expert involvement in international affairs - *Nature* for example referenced Lefebure in its call for scientists to be given a central role within international disarmament discussions.³⁵

III Militaristic Perversion

The second aspect of disarmament discourses, the notion of militaristic perversion, has its roots in nineteenth century liberal thought. From the middle of the century onwards liberal intellectuals had come to posit an opposition between industry and trade on the one hand and war and militarism on the other. Richard Cobden and others had argued that industrial and trade policies, and growing industrialisation and international trade, led to international peace. Militaristic policies, on the other hand, were detrimental to industrial and commercial development. Central to this understanding was the assumption that modern science and industry were essentially civilian and peaceful in character, and that military developments were a perversion external to modern science itself.³⁶ By the early twenties this Cobdenite thinking had become incorporated into a liberal critique of militaristic perversion. English economist A.C. Pigou's 1921 well-known critique of militarism and the costs of war, *The Political Economy of War*, for example, counted the militaristic perversion of civilian land and sea transport as one of the burdens of war, and foretold that aviation too would be 'twisted' from its 'normal development' as long as governments continued to 'exercise control over the design of commercial aircraft' and 'have a voice in preparing air routes and determining the situation of aerodromes.' In these cases the threat was that the government would develop civilian aviation such that it could easily be converted for military use, thus interfering with the 'free play of economic forces' and leading to 'less efficient instruments of communications in normal times'.³⁷ This critique was thus an attack on the military's influence in scientific and industrial research and development, and a call for this development to be directed by civilian technical experts (or the free market), who, it was argued, were best placed to ensure that industries were developed for the social and economic wealth and well-being of the nation.³⁸

By the late twenties this critique had come to underpin internationalist calls for arms control and international regulation or 'control' of strategic national industries. Noel Baker's *Disarmament* referenced Pigou's work, and extended its arguments to virtually all of heavy industry: militaristic aims were 'diverting the normal channel of industrial development' - the 'iron and steel industries, the engineering industry; some chemical industries, iron-mining and coal-mining' as well as 'big shipyards and aircraft factories'. These were modern technical and scientific enterprises, and as such then there was also the 'perversion of scientific and inventive genius', that is scientists and engineers, from commercial ('productive') to military ('unproductive') research and development.

³⁴ Lefebure, *Scientific Disarmament*.

³⁵ Editorial, 'A Scientific Approach to Peace', in *Nature*, 17 Nov. 1934, pp. 749-51.

³⁶ Howe, 'Free Trade and Global Order'.

³⁷ Pigou, *The Political Economy of War*, pp. 9, 10.

³⁸ For more on the militaristic critique see: Edgerton, *Warfare State*, pp. 2, 12.

Complete disarmament, he concluded, could only be achieved when all modern industries and scientific research was shielded from the military.³⁹

This argument became central also in proposals for the international control of civil aviation in the 1930s. Only international control, it was argued, would separate civil aviation from the militaristic and nationalistic influences of nations, thus allowing it to develop along its inherently pure commercial trajectory. Only in this way would the world reap the fullest rewards of air travel's internationalist bounty: growing commerce and contact amongst nations, and the ensuing spread of international peace. Some went further, and argued that the governing international organisation could utilise convertibility itself by treating its own commercial aerial fleet as a military reserve, to be used if necessary for international policing.⁴⁰ Internationalists such as Salvador de Madariaga, the Spanish diplomat and League official, based their calls for international control of aviation (and in his case, also chemicals industries) on the premise that 'military and naval reasons warp, distort and even subvert economic laws at every turn'. This militaristic perversion, internationalists argued, had begun in World War One, which whilst accelerating the military development of civilian inventions at the same time hindered their natural development, which was civilian and peaceful in nature.⁴¹ International control, argued David Davies, was the only practical solution to the problem of modern scientific armaments, whose roots lay in modern scientific industry. These industries could naturally be turned to militaristic ends, so the only other solution, too extreme to imagine, would be to abolish the industries themselves.⁴²

Amongst liberal internationalists the militaristic perversion argument fed off underlying concerns (real or imagined) about the political power of national militaries, the militaristic tendencies of government policy-makers and the civil service, the growth in armaments ('rearmament'), and ultimately growing tensions in European international relations. In the mid-1930s it was also closely related to concerns about arms manufacturers ('merchants of death'), and their pernicious effects on international stability.⁴³ The MP and one-time conscientious objector Morgan Jones, in the Commons in March 1932 expressed 'apprehension' that 'civil aviation is largely controlled by the Air Ministry...I fear they regard civil aviation and its development purely from the standpoint of the convenience of the military machine; and we cannot afford to minister to that kind of mentality in these days.'⁴⁴ Noel Baker turning in 1934 to consider why the Geneva Disarmament Conference was failing, blamed civil servants, politicians, and arms manufacturers. He faulted bureaucrats for their inertia and old-fashioned thinking, and politicians for the hold General Staffs had on them. Military men, who 'naturally' loathed to reduce their military forces, had in turn 'had a powerful ally in the vested interests of the armament firms'. These, he argued, 'by their manipulation of the Press, embroil the international situation, and obscure from hesitating politicians the strength of the popular demand for peace.'⁴⁵

The militaristic perversion argument was also deployed by supporters of British aviation to criticise foreign governments' support for their aviation industries. For aviator and Conservative MP Colonel Moore-Brabazon the First World War had led to massive government support for military aviation, with commercial aviation lagging behind. 'If

³⁹ Noel Baker, *Disarmament*, pp. 11, 14.

⁴⁰ Zaidi, "'Aviation Will Either Destroy or Save Our Civilization'"; Holman, 'The Shadow of the Airliner'.

⁴¹ Madariaga, *Disarmament*, pp. 7–8. See also Madariaga, *The World's Design*, pp. 64–9.

⁴² Davies, *Problem of the Twentieth Century*, 297–339.

⁴³ Anderson, 'British Rearmament and the "Merchants of Death"'.
⁴⁴ *Hansard* (Commons), 5th ser., CCLXII, 10 Mar. 1931, cols. 2025–26.

⁴⁵ Noel Baker, 'Peace and the Official Mind'.

motoring had been born in war-time in the same way', he quipped, 'we should all be going about the streets of London in tanks.' Yet for him the British state was only guilty of neglecting civilian aviation, or influencing its development indirectly. Italy, France and Germany had directly perverted civilian aviation by 'fostering' it for military purposes so that it could act as a reserve in time of war.⁴⁶

These critiques reached a highpoint in the years 1936 to 1938 when the government came under attack in Parliament and in the press for its large subsidies to Imperial Airways. The airline, in turn, was condemned for its economic and operational inefficiency, and mistreatment of employees. The subsequent report of the Committee of Inquiry into Civil Aviation (the 'Cadman Report') vindicated criticism of the way government managed and regulated commercial air routes, and so was seen by many as evidence of the militaristic perversion of aviation. A *Nature* editorial welcomed the Report as proof that 'throughout the post-War period, the development of civil aviation in Great Britain as in other countries has been warped by military demands.' *Nature* in particular focused on the Cadman Report's claim that Air Ministry research had a 'military bias' and its recommendation that research and development now be headed by a civil officer. Research areas which had been neglected by this military bias, but which are now needed in order to keep pace with civil aviation in the United States included, *Nature* noted, the prevention of ice formation, pressure cabins automatic blind landing equipment, anti-static electricity devices, and wireless.⁴⁷ Internationalists too cited the Report in support for their calls for international control – as in for example a 1943 memorandum by the Chatham House transport expert, Harry Osborne Mance.⁴⁸

IV World War Two

The Second World War signalled two important changes in the discourses on convertibility. First, aerial convertibility now came to be much more widely discussed and debated in the United States, particularly in relation to the regulation of postwar international civil aviation. Second, the notion that convertibility was easily achieved was now increasingly challenged in policy debates, both in the United States and Britain. The massive wartime military research and development efforts appeared to demonstrate that military technology could not simply be converted from civilian science and technology. Development in aerial technology appeared to demonstrate the increasing divergence of military aircraft from the commercial.

Convertibility was debated in American think tanks and in government policy circles during discussions on policy options for postwar international aviation. A few stressed the ease of converting civilian transport to bombers. Professor of international law Oliver Lissitzyn, writing in 1940 in *Foreign Affairs*, not only emphasised the importance of commercial aviation as a 'reservoir of equipment and personnel for military aviation', but also claimed that 'it is still possible to convert many of the modern airliners into fairly efficient bombers...Civilian aircraft can also be used for training purposes' and for 'the transportation of troops and supplies'.⁴⁹ On the whole, however, the discourses on

⁴⁶ League of Nations Union, *The Problem of the Air*, pp. 22-3.

⁴⁷ 'Civil Aviation in Great Britain', in *Nature*, 2 April 1938, pp. 571 – 73. On the Cadman report see: Lyth, 'The Changing Role of Government in British Civil Air Transport 1919-49'. On Imperial Airways see: Pirie, *Air Empire*, pp. 178-234.

⁴⁸ Mance, *International Air Transport*, p. 76.

⁴⁹ Lissitzyn, 'The Diplomacy of Air Transport'.

convertibility stressed its limits. Arguing against full and quick convertibility of aircraft helped policy-makers and experts make their case against strong international regulation of international civilian aviation after the war. Experts on international relations at the New York-based Council on Foreign Affairs, meeting in the early forties to discuss the possibility of the formation of a postwar international political organisation, argued that whereas the similarities in civilian and military aircraft in the early thirties may have made the international control of aviation a real possibility then, this possibility had now receded, due to the 'rapidity of technical progress during the present war'.⁵⁰ One 1940 memorandum on the need for postwar disarmament stressed only the possibility of converting commercial aircraft to military transports, which however could be easily done as it required only the 'removal of unnecessary interior fittings'.⁵¹ Aerial analyst Keith Hutchison explained in his widely-distributed 1944 pamphlet on postwar aviation that:

Since the beginning of the present war, however, we have seen increasing differences between military and civil types. Fighter planes, for instance, have no civilian use except possibly for stunt flying. Some bombers can be converted into transport planes, but the result is a make-shift that will not appeal to the commercial operator who can get anything better. The reverse process, converting transport planes into bombers, is less satisfactory.⁵²

Nevertheless, it continued to be widely assumed in the United States that other aspects of civilian aerial infrastructure could be easily converted to military use. Since the 1920s champions of American domestic aviation had been making the case for the development of domestic civil aviation by emphasising its utility for military purposes. These arguments emerged most prominently during a 1934 Federal Commission on aviation, which had listed four ways in which civilian industry could be used for military purposes. The report however, noting that the convertibility of aircraft was widely assumed and feared in Europe, concluded that in the United States the military uses of civilian air transport 'depend for their value upon the volume of transport operation, not upon the type of equipment used. Any similarity of design between transport and military airplanes is of almost incidental importance.' Nevertheless the report had conceded the possibility of military influence on the design of civilian aircraft by concluding that 'We recommend that nothing be done to encourage any such similarity'.⁵³ These sentiments continued into the war, where they were transferred into discussions on postwar international civil aviation. In a *Foreign Affairs* article published in early 1942 international lawyer Grayson Kirk listed a number of ways in which 'civilian air lines perform an important military function', including gathering data on weather conditions and developing pilot experience.⁵⁴ Civil aviation expert J. Parker Van Zandt's 1944 study on postwar *Civil Aviation and Peace* similarly argued against the direct convertibility of civilian aircraft to fighting military aircraft, but nevertheless pointed out that civilian aviation could not be 'de-militarised' as it could perform at least seven vital military services during wartime.⁵⁵ The internationalist Universities Committee on Post-War International Problems, which polled its member

⁵⁰ G. Kirk, 'International Policing (A Survey of Recent Proposals)', 3 Oct. 1941, W-83-A-B30, Fiche 376, Council on Foreign Relations Papers, LSE Library, London School of Economics and Political Science.

⁵¹ Warner, *Possibilities of Controlling or Limiting Aircraft*.

⁵² Hutchison, *Freedom of the Air*, p. 13.

⁵³ Federal Aviation Commission, *Report of the Federal Aviation Commission*, p. 79.

⁵⁴ Kirk, 'Wings over the Pacific'.

⁵⁵ Van Zandt, *Civil Aviation and Peace*, pp. 23, 27.

university committees in 1944 also found that its respondents concluded that although 'because of increasing functional specialization of aircraft design, planes for civil air traffic cannot be directly converted to military use', nevertheless 'aircraft production facilities, aircraft mechanics and air crews can be.'⁵⁶ And, indeed, from 1942 onwards the United States increasingly pressed civilian aviation into military use, including the use of civilian airliners for as military transports through newly formed organisations such as the Air Corps Ferrying Command and the Air Transport Command.⁵⁷

In Britain, internationalists demanding strong international regulation of military and civil aviation continued to warn of the dangers of convertibility. Chatham House's transport expert, H. Osborne Mance, for example, produced a series of reports calling for the international control of aviation, citing the continued convertibility of civil to military aircraft as a rationale.⁵⁸ Supporters of British civil and military aviation also continued to use convertibility arguments to push for greater suppression of German and Italian civil aviation after the war. Yet their support for convertibility was tempered with the realisation that the same arguments could be used in support of international control of British aviation. Aerial industrialist Frederick Handley-Page, writing in *International Affairs* in 1944, agreed with Mance that 'it is impossible to separate the manufacture of civil aircraft from that of military aircraft. Undoubtedly, this view will be reflected in measures to place the aircraft industries of the Axis Powers under drastic control, and preferably to suppress them altogether.' However, this did not portend the international control of civil aviation, for:

How far civil and military aeroplanes might be readily interchangeable in future is difficult to estimate. They may follow the ship and become more and more distinct; or, conceivably, the invention of some new kind of weapon which did not need special gun-turrets and bomb-bays might make them interchangeable merely by the installation or removal of special war equipment. In an art and science so fluid as aeronautical engineering, it is unwise to be dogmatic.⁵⁹

By the end of the war, the notion of converting civilian aircraft to aggressive military use died altogether, and the word 'convertibility' followed soon thereafter. The 1944 Chicago Conference on international civil aviation acquiesced to the American vision of postwar aviation by laying the foundation for a lightly regulated aerial regime which was buttressed by the assumption that civilian airliners were of little military value. Convertibility was discussed at the conference, but the winning view was expressed by Adolf A. Berle, the U.S. Assistant Secretary of State, when he informed the conference that 'According to experts, it is not possible to convert a peaceful transport plane into an effective instrument of war despite wide-spread popular misconception to the contrary'.⁶⁰

Civilian aircraft and their associated facilities continued to be seen as having military value as a 'reserve'. The 1948 the U.S. Air Policy Commission Report, *Survival in the Air Age*, for example, made the case for continued government support for the civilian aircraft industry and 'personal aviation' by arguing that in any future war airlines would be used

⁵⁶ Universities Committee on Post-War International Problems, 'Summaries of Reports of Cooperating Groups'.

⁵⁷ Larsen, 'The Air Transport Command'.

⁵⁸ Mance, *International Air Transport*; idem, *Frontiers, Peace Treaties, and International Organization*.

⁵⁹ Handley-Page, 'International Air Transport'.

⁶⁰ Berle Jr., 'International Civil Aviation Conference'. On the conference see, Sochor, *The Politics of International Aviation*; Dobson, *A History of International Civil Aviation*, pp. 37-51.

for military transport, and civilian factories, facilities and personnel more broadly for America's air forces.⁶¹ This was part of a continuing wider prevailing view that civilian factories could be easily pressed into military use. Henry Morgenthau, Jr.'s proposals for the deindustrialisation of occupied Germany, for example, were based on the assumption that heavy industry was required for modern mechanized military forces, and that individual civilian factories may be 'converted' to military use. His 1945 polemic *Germany is Our Problem* focused in particular on the metallurgical, chemical and electrical industries (though without any reference to the convertibility of individual aeroplanes or ships).⁶² Other allied planners organising for German disarmament paid more attention to which factories, industries, technologies, and sciences needed to be decommissioned, and which should be allowed to function. The U.S. Foreign Economic Administration (and later, the State Department) were however unable to produce coherent recommendations for differentiating safe from unsafe industries and factories. Implicit in their 1945 recommendations to the Allied occupying authorities was the recognition that almost all industry had military value. They suggested ongoing inspection of industry and scientific research and development by the occupying authorities as a means of preventing German military resurgence, rather than wholesale destruction of heavy industry. At the Potsdam Conference the Allies decided that all shipyards and aircraft factories were to be decommissioned. In March 1946 however the Allied Control Council produced their own lists of plant and machinery to be destroyed, but these largely choose to differentiate between safe and unsafe industry by targeting for destruction plant which produced specific materials such as magnesium, Beryllium, and synthetic oil and rubber. The exception was the shipping industry, where all ships (excluding fishing vessels) were to be decommissioned.⁶³

During the Second World War, the militaristic perversion argument was rarely found in U.S. discussions on postwar disarmament or aviation, and even in Britain it was greatly diminished in these discussions and the discourses that surrounded them. In the interwar years the argument had been used in order to bolster the case for more civilian technical involvement in scientific and technological research and development. During the Second World War civilian technical experts were pressed into the service of the war effort, often in decisive advisory or decision-making positions, thus reducing the usefulness of the perversion argument. Criticising Allied militaries for abusing science and technology for warlike purposes in the midst of what was widely seen as a righteous war was anyhow problematic. Nor was the projection of perversion arguments onto Germany easy when Allied militaries were themselves using many of the same technologies, such as bombers, in the same way. Elements of the argument continued to exist of course, particularly the notion that technologies such as aviation (in particular) were essentially peaceful both in its effects and in its origins. Van Zandt's *Civil Aviation and Peace* posited civil aviation's peaceful effects, posited military aviation as a different type of aviation, and only related military and civil aviation through seven ways in which civil aviation could be used for military purposes. This, however, was not described as a perversion, but rather as a natural necessity during wartime. Perversion arguments remained more prominent in Britain, and were mostly associated calls for the control of postwar civil aviation by a powerful international organisation. The Labour Party's policy on postwar aviation, issued in 1944,

⁶¹ Air Policy Commission, *Survival in the Air Age*, pp. 59, 123-4

⁶² Morgenthau, Jr., *Germany is our Problem*, pp. 13, 16-7.

⁶³ Oliver Haller, 'Destroying Weapons of Coal, Air and Water', pp. 160-206; and Cassidy, 'Controlling German Science'. On German disarmament generally see, Towle, *Enforced Disarmament*, chapter 8.

for example, began with the argument that militaristic attitudes still threatened the pacific development of civil aviation, and consequently that international control would be required after the war. Similarly, state committees (such as the Shelmerdine Committee) considering postwar civil aviation recommended international control, and cited the need to protect civil aviation from militaristic abuse as an important reason. Once international control was rejected at the 1944 Chicago Conference on international aviation, however, these arguments disappeared.⁶⁴

V Conclusion

Convertibility was a widely held belief and a widely used trope in the interwar years because it could easily be mobilised to support a wide range of positions with regard to the aviation and chemicals industries, arms control, state regulation, and criticism of foreign states. It could be, and was, used to support a range of political positions: nationalist, internationalist, liberal, and conservative. Militaristic perversion arguments were more narrowly located within liberal internationalist discourses. Both fed off widely held assumptions about the nature of modern science, technology, and military-civilian relations. It was widely assumed that modern armaments originated in civilian scientific invention, which was then developed for military purposes. For many the natural, including the most economical, trajectory of scientific and technological development was civilian, with the militaristic development a perversion. These arguments moreover reflected a largely enthusiastic attitude towards modern industry, including civilian aviation in particular. In these discourses it was largely accepted that the British state needed to support the growth of modern scientific industries – the question was the extent of military involvement and state control.

Once the growth of massive military research and development during the Second World War, and the attendant development of military aircraft, challenged this assumption, convertibility dropped away from the discourses on military weapons and arms control. It did not disappear altogether however – it was revived after the war in 1946 during attempts at atomic disarmament, in the form of for example the influential U.S. state department-sponsored Acheson-Lilienthal Report and the official U.S. Baruch Plan placed before the United Nations, the former of which based its proposals for international control of atomic energy on the notion that the ‘development of atomic energy for peaceful purposes and the development of atomic energy for bombs are in much of their course interchangeable and interdependent.’⁶⁵ Although attempts at the international control of atomic energy failed, notions of convertibility would survive and continue to be used in discourses surrounding the international regulation of atomic activities in the 1950s, and nuclear arms control in the 1960s. These beliefs about the convertibility of technology live on today through concepts such as ‘dual use technology’ and are institutionalized in the work of international organizations such as the IAEA.⁶⁶

Recognising the convertibility and militaristic perversion arguments as an integral part of

⁶⁴ Van Zandt, *Civil Aviation and Peace*, 23, 27. The Labour Party, *Wings for Peace*. TNA, Interdepartmental Committee on Civil Aviation, *Interim Report to the Minister without Portfolio*, CAB 117/187, 5 Jan. 1942. On state planning for postwar aviation see: Brewin, ‘British Plans for International Operating Agencies for Civil Aviation’.

⁶⁵ Barnard et al., *A Report on the International Control of Atomic Energy*.

⁶⁶ The Statutes of the IAEA, approved 1956, note that the organisation is formed to prevent the ‘diversion’ of atomic facilities from civilian to military use. See, <https://www.iaea.org/sites/default/files/statute.pdf>, accessed 25 Mar. 2017.

interwar and wartime discourses on disarmament is an important step in furthering our understanding of the history of arms control. These arguments helped construct and shape notions of what disarmament meant, as well as the boundaries between the civilian and military industry, technology, and science. Their study consequently points to the socially-constructed and contingent nature of concepts often at the heart of arms control, and to the deep connections between these concepts and the politics and political positions of their day. The existence of these arguments points to the need to move beyond diplomacy and policy-making, and to study arms control in wider cultural, political, and social contexts.

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