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A Comparative History of Aviation during the First World War in France and in Italy: Some Preliminary Suggestions

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EDITOR'S NOTES

Éric Lehmann would like to thank Béatrice Sans, English teacher at the Lycée Français Jean Giono, for the translations of the texts.

TEXT

- 1 The four articles that make up this main theme section are taken from a much larger body of work presented at the bilateral symposium, *La Grande Guerre aérienne. Regards croisés franco-italiens/La Grande Guerra aerea. Sguardi incrociati italo - francesi*, [The Great Air War: Franco-Italian Comparisons] in Turin on April 15, 2016 thanks to the valuable support of the *Fondazione De Benedetti Cherasco 1547 Onlus*.¹ This selection is designed to offer the international readership of *Nacelles* an opportunity to discover the most recent trends in the transalpine historiography of the Great Air War in three areas: industrial and operational growth of military aviation; procedures for recruiting and selecting pilots; and the development of aviation strategies.
- 2 Yet the ambition of the symposium at which these four papers were presented was broader: it was designed to satisfy needs of both the scholarly community and readers who, on both sides of the Alps, are interested in the early developments of the Air Force, in the history of the First World War and, more generally, in the many facets of twentieth-century military history. The first goal of the conference was to fill a lacuna in the vast panorama of research publications on the First World War, which grant very little attention to the role and specific characteristics of the Air Force, when they do not ignore it altogether.² Second, the conference organisers sought to enrich and, if possible, go beyond the strictly national narratives of the conflict, with a mirror-like approach allowing us to compare and contrast the

history of the air war in France and Italy. Such an undertaking was unprecedented, but was amply justified by the strong points of convergence between the two countries' contexts.³

3 The People: Early and Lasting Cultural Exchanges

4 First and foremost, against a backdrop of cultural, technical, scientific, and military exchanges it was human relationships that were built early on through contacts between the pioneers of French and Italian aviation. Aviator Léon Delagrangé's trip to Rome with manufacturer Gabriel Voisin in 1908 was probably the first great opportunity to establish such relations. Although the first holder of a pilot's license in Italy, Lieutenant Mario Calderara, learned to fly with Wilbur Wright, the Rome Airman's Club, at the initiative of its president, Major Maurizio Mario Moris,⁴ invited Delagrangé to give some lessons in the Italian capital in April 1909. Earlier in 1908, Calderara had stayed and worked a few months in Issy Les Moulineaux alongside the technician Ambroise Goupy and Gabriel Voisin, whom Calderara had met in Rome during Voisin's trip to Rome. With Goupy, Calderara had even built, developed and flown a traction propeller biplane of his invention.⁵ As for Louis Blériot, his successful crossing of the Channel on July 25, 1909 was partly due to the reliability and performance of the airplane engine that had been designed and built by Italian mechanic Alessandro Anzani, who had settled in Paris in 1902 to sell motorcycles.

5 Transalpine relations and exchanges in aeronautics continued to intensify, particularly through air shows such as the one organized in Montichiari, near Brescia, in September 1909. There, alongside numerous Italian competitors such as Mario Calderara, the French airmen Louis Blériot, Henry Rougier and Alfred Leblanc participated. And in May-June 1911, the celebrations committee for the commemoration of the fiftieth anniversary of the birth of the Kingdom of Italy and the Executive Board of the International Exhibition at Turin, in collaboration with the Parisian daily *Le Petit Journal*, organized an air rally on the Paris-Rome route. The participants included the French pioneer Roland Garros, who came in second in Rome behind his compatriot Beaumont.⁶

6 The bonds created on both sides of the Alps were also military in nature. At the end of 1910, Maurizio Mario Moris, now lieutenant-

colonel, was sent to France to buy five Blériot XI planes on behalf of the Italian government. Most of the 91 aircraft in service in the Italian Army's first aviation unit, the *Battaglione aviatori* founded in July 1912, were of French origin, with 41 Blériots, 17 Nieuports and 10 Maurice Farmans.⁷ Some of them were used the same year in the first air warfare operations conducted by the Italians in Cyrenaica and Tripolitania against the Ottomans. As for Francesco Baracca, the future ace of the Italian Aces of the First World War, he had learned piloting, in the company of four other young officers who like him came from Italy, and obtained his pilot's licence in May-July 1912 at the Hanriot de Bétheny flying school near Reims, France. Three years later, he was part of a group of officers and non-commissioned officers and mechanic-soldiers sent to Paris by the Italian authorities to familiarize themselves with two new aircraft, the Nieuport fighter 10 and the light bomber, Voisin 5, on which the Italian group trained for two months (May - July 1915) at the Le Bourget airfield.⁸

- 7 We also know that almost all the aeronautical lexicon used in Italy during the Belle Époque, during the Great War, and in its aftermath was borrowed from French. This linguistic influence was due to the precocity of aviation in France, without a doubt the country in which aeronautical experiments and manufacturing, as well as flight schools, competitions, and air rallies, developed the earliest and to the greatest extent. This linguistic supremacy was accepted with good grace by the Italian airmen because of the long-term and solid relations in transalpine aeronautical circles, but also and perhaps mainly because of using this jargon, which deepened the gap separating them from the uninitiated, and reinforced their feeling of belonging to an aristocratic caste. The rare manifestations of rejection and hostility towards aviators came from futuristic circles in the aftermath of the war. In an article published in 1921 in the weekly *La Gazzetta dell'aviazione*, founded and directed by former pilot and early fascist activist Attilio Longoni,⁹ the writer Filippo Tommaso Marinetti went to war in an ironic tone against the use of foreign words and aeronautical phrases:

In Oxford, in an old Broad Street building, surrounded by some of the colleges and libraries that are the pride of this glorious University, a group of scientists was completing a project begun about 60 years before: the *New English Oxford Dictionary*.

At the letter D, there are 19,051 words...with 85,446 citations. And there are dedicated no less than 109 columns for only three words: hand, head, and heart, with their derivatives listed in section H.

We, a little faster than these soft people focused on the past...have created this little dictionary of aeronautical expressions.¹⁰

- 8 There followed a list of forty Italian words or expressions intended to replace the French terms then in use. In 1929, Marinetti and the aviator, painter and futuristic publisher Fedele Azari,¹¹ went even further by writing a real dictionary. In the preamble they declared to have four objectives:

1) Absolute Italian-ness of all the words

2) Absolute clarity of all the words

3) Technical precision to make the dictionary useful even to technicians

4) Alive orally, insofar as the chosen words are actually used among aviators¹².

- 9 But it was the first of four objectives, in the controversy over the domination that the French language continued to exercise on the Italian aeronautical lexicon, that drove the creators of this dictionary, as evidenced by the note inserted by the editor at the end of the volume:

I present this most Italian work whose importance and timeliness will be appreciated by those who directly or indirectly are interested in aeronautical activity, that is to say almost all the entire public [sic].

The first Italian aerial dictionary is born while the Italian wing, revived by the will of the DUCE, prevails in the most challenging competitions worldwide. This book completes our complete emancipation, even linguistically.¹³

- 10 However, apart from the futuristic claim of lexical independence, transalpine cultural relations in aeronautics did not end with the outbreak of the Great War, which contributed on the contrary to consolidating them due to Italy's switch into the Entente camp in the spring of 1915. Nor did relations end in the aftermath of the conflict, insofar as aeronautical propaganda, developed early on by the fascist movement and then by the fascist regime, completed the fusion of the French hagiographic model celebrating the aces of aviation with the literary tradition of funeral orations composed by the poet-fighter Gabriele D'Annunzio during the conflict.¹⁴
- 11 The Machines: Strong Economic and Technological Bonds
- 12 On both sides of the Alps, there were also strong industrial and technological relations, furthered by Italy's entry into the war in 1915. 43.8% of Italy's 11,014 aircraft and military seaplanes, that is 4,830 aircraft, and 15.6% of the 24,400 aircraft engines, or 3,816 units, manufactured in Italy from 1915 to 1918, were of French design - Maurice Farman, Nieuport, Blériot, Caudron and Hanriot airplanes, FBA seaplanes,¹⁵ Gnôme & Rhône, Hispano-Suiza and Salmson engines. These were made under license by Italian firms, mainly by Macchi de Varese, licensee of Nieuport, by the Società Idrovolanti Alta Italia (SIAT) of Sesto Calende, holder of FBA licenses, and by Fabbrica Italiana (renamed Società Italiana in March 1916) holder of Gnôme & Rhône engine licences in Turin.¹⁶ The dependence of the Italian aeronautics industry and Air Force on France, its transalpine ally, was reinforced by the delivery of several hundred other aircraft and engines built in France.¹⁷ Whatever the source, the models most representative of this one-way cooperation were mostly Nieuport 11 and 17 fighters, SPAD VII and XIII, and Hanriot HD 1, FBA seaplanes and Le Rhône 120 HP engines.
- 13 On the other hand, the rare attempts to sell or manufacture Italian planes in France ended in failure. Among the 700 bombers ordered by the French authorities from November 1915 to March 1916, there were 120 Caproni Ca.3, which were to be built under license by the aircraft manufacturer REP (Robert Esnault Pelterie),¹⁸ only a few of which ever flew in combat. As for the negotiations conducted in 1917-1918 to make the heavy bomber 600 HP Caproni Ca.5 in France, they did not succeed, notwithstanding the efforts of engineer Giovanni Caproni.

He had come to Paris in August 1918 to negotiate in person the creation of a firm in partnership with the banker Dreyfus and to try to sell his planes directly to the President of the Council, Georges Clemenceau and the Minister of Armament, Louis Loucheur.¹⁹ But by that date, Clemenceau had already opted for the Breguet XIV for most of the new aviation bombing programme. Of the 600 bombers ordered, only 50 were Caproni Ca.5, which in fact the Bessoneau and REP firms were unable to deliver, because of problems encountered in launching the production process. On this point, the wrongs were apparently shared by all: while, on the one hand, it is never easy to build something from plans designed by others, is it also possible that the blueprints provided by Caproni were somewhat imprecise and that the design was not fully completed. This is suggested by the slowness of production in Italy itself, where only 190 of the 3,500 Caproni Ca.5 ordered in November 1917 were manufactured before the end of the war.²⁰ The incidents involved in this failed bilateral collaboration are evidenced by two telegrams sent to Caproni by the Under-Secretary of State for Military Aeronautics, Jacques-Louis Dumesnil, in May and July 1918, urging him to come to France or to send his best engineers in order to assist his French partners,²¹ and also the harsh assessment by the Army Committee of the Chamber of Deputies in the aftermath of the conflict:

The Caproni planes failed the static tests in a lamentable way. This was expected. A report from Colonel Dorand on his return from a trip to Italy had pointed out that the static tests had not been done by the Italian technical department and that it was necessary to ensure the solidity of the planes before placing an order in France. The ministers in charge, despite this, gave a favourable opinion on ordering these planes. And so we launched manufacturing. Through their fault, months have been lost...²²

- 14 All in all, the asymmetry of Franco-Italian industrial relations in aeronautics was the logical result of the difference in productive and technological power that had already separated the two countries on the eve of the war. Nevertheless, 23,520 aircraft and 44,033 aircraft engines were produced by French factories in 1918,²³ while they had produced only 796 airplanes and 2,355 engines in 1914. Italian manufacturers also had remarkable growth, which is only partially attribut-

able to deliveries or the licensed production of French equipment: 382 aircraft and 606 engines in 1915 and 6,518 aircraft and 14,820 engines in 1918.²⁴ Aircraft production multiplied by thirty in France, by twenty-five in Italy, and that of engines multiplied by nineteen in France and by seventeen in Italy. These data show the tremendous parallel and complementary growth of aeronautic construction during war in these two states.

- 15 This parallelism in the production curve continued with industrial demobilization in the aftermath of the conflict. According to an official booklet dated November 1918,²⁵ the Italian Air Force, both Army and Navy, had about 6,000 airplanes in their fleets or in reserve, all with engines, parts and spare parts and replacement engines, 2,000 aircraft under repair, 1,000 aircraft under construction and 12,560 engines, of which 9,060 were in service – that is, mounted on aircraft or stored in the squadrons' hangars as a replacement – 1,500 under repair and 2,000 awaiting delivery. In comparison, on November 11, 1918, the air power of the French armed forces consisted of 4,398 aircraft deployed on the various fronts, 3,886 aircraft in reserve, 3,552 other aircraft used in flying schools or stored in centres behind the front and a stock of about 20,000 engines.²⁶
- 16 But in both states, the inevitable demobilization soon led to a fall in orders for aviation equipment, a contraction in aeronautic production, a reduction in the number of workers employed in factories and design firms, and the liquidation of stocks, whose abundance limited the possible outlets for these planes, which was already considerably reduced because of the cessation of hostilities. Like all former belligerents, France and Italy therefore had to face the thorny issue of the reconversion of an economy that had been profoundly altered by the war, and aeronautical production, which had been more like a craft on the eve of the conflict, was a case in point. This was because the armies' increasing need for aviation equipment had given rise to a large industrial sector, although it consisted mainly of a large number of subcontracting firms working under license from the largest aircraft manufacturers to make up for the latter's insufficient production capacity.²⁷
- 17 It was therefore in this context of a sudden contraction in demand and business, immediately following the period of explosive growth in

manufacturing, that the governments of both countries were forced to act. In Italy, a report from the special commission created at the request of the President of the Council, Francesco Saverio Nitti, at a meeting of the War Committee on June 5th, 1920, provides information of the highest importance.²⁸ On 7 and 8 June 1920, under the chairmanship of Vincenzo Giuffrida, the Under-Secretary of State for the Merchant Marine, Fuels and Aeronautics, the leaders of the three aeronautical services met: Commander Valli, Naval Aeronautics Inspector, General Amodeo De Siebert, Military Aviation Inspector, Colonel Carlo Berliri-Zoppi, Head of the Civil Aeronautics Branch, and Colonel Halinger, Chairman of the Commission for Liquidating War Stocks. The minutes of the meeting sent to the Chairman of the Board are supplemented by four tables of statistics on the number and types of aircraft and engines and the stocks intended for liquidation. Three observations can be made on the basis of these documents. First, it appears that, nineteen months after the armistice, Italy still had an impressive number of aircraft, 3,007, and above all, engines: 10,823. It also appears that the army, the navy and the general directorate of civil aeronautics had much lower needs than the existing stocks, since they asked for respectively 1,700, 823, and 100 aircraft and 4,700, 1,000 and 100 engines: in total, only 87% of the aircraft and 53% of the engines lying in the warehouses. It should be noted that the Army and the Navy actually had to renounce a significant portion of the numbers they requested - 277 aircraft and 830 engines for the former, 395 engines for the latter - because the models requested were not available in sufficient quantity. This is proof that the conservation of stock was not necessarily the best solution to equip the armed forces with material adapted to their needs.

- 18 Finally, the Committee asked the government to proceed with a rapid liquidation of these now useless stocks in order to improve the industrial and financial health of the aeronautical sector and to streamline the equipment of the armed forces. To this end, the commission recommended that "the depots should be cleared out of this material within three months by selling it, giving it away, and even destroying it if necessary."²⁹ It is undeniable that the authorities, far from losing interest in aviation and wanting to destroy the industry, were aware that the overabundance of stock inherited from the boom in manufacturing during the war was detrimental to the development of avi-

ation during peacetime. In France at the same time, the Under-Secretary of State for Aeronautics and Air Transport, Pierre-Etienne Flandin,³⁰ pursued the same policy. On 26 June 1920, the Group for the Liquidation of Aviation Stock was created, which on July 9 took the definitive name of Commercial Company of Aviation Stock. This body including almost all aircraft manufacturers who bought the stock from the state and then resold it. Emmanuel Chadeau, from whom we have this information, judged that the action of this company was effective: "It was a success...in 1923, it had completely cleared out the market, certainly by reselling at a low price (at the beginning to 60 % or 40% of the price of the "old materials" and less afterwards), but made comfortable profits."³¹

- 19 The liquidation of stock, in Italy as in France, was therefore not the work of blind destruction, but that of a necessary cleaning out which could only be carried out properly by selling the equipment, often obsolete, at a low price. This equipment not only encumbered the depots, but was above all an objective obstacle to the revival and the modernization of aeronautical construction. There was, however, a significant difference in the behaviour of manufacturers on each side of the Alps: the French manufacturers, who had joined together in a consortium to buy their own planes back, had fully appreciated the extent of the situation. Yet their Italian colleagues did not do so and the market was hampered in a more lasting way, to the point that some of them, such as Giovanni Caproni and Ottorino Pomilio, tried, without success, to set up their businesses in the United States.
- 20 As for the authorities, they wanted to mitigate the painful impact of demobilization by looking abroad for outlets able to absorb part of the stock, by sending aeronautical groups to demonstrate the quality of the aircraft, the engines and the accessories made in Italy. This practice was not altogether new, since even before the end of the war Italy had sent nine aeronautical military missions to the countries of the Entente and in the States associated with it, where they had four tasks: propaganda, sale of equipment, technical liaison and information services, and support for Italian companies exporting or wishing to present their products abroad.³² Propaganda and marketing were thus accentuated after the war, in the hope of selling some of the now useless production; however without much success.

- 21 As for France, the world's top air power in 1918-19, it was only from 1924 that aeronautical manufacturing came out of the post-war depression, thanks to the revival of public orders to replace obsolete equipment in the military's stock.³³ This business recovery was also facilitated by the wear on some planes, which was now deemed unnecessary to repair because they soon became obsolete. On this point, an example from Emmanuel Chadeau's book on the history of the French aeronautics industry is appropriate: "in 1922, more than 100 Farmans were ordered to be written off in 1920 because they rotted in the airfields even before they had been able to be used."³⁴
- 22 These preliminary considerations are naturally not intended to exhaustively cover the history of the Great Air War in France and Italy. Their purpose is merely to provide some useful references for continuing and deepening research that would enable us to build a transnational history of air warfare on both sides of the Alps.

NOTES

1 All of the papers in Italian can be consulted in the volume recently published by the publishing department of the *Aeronautica Militare italiana*: E. Lehmann, *La Grande Guerra aerea. Sguardi incrociati italo - francesi* (Rome: Difesa Servizi SpA – Edizioni Rivista Aeronautica, 2017).

2 To be convinced of this, it suffices to consult the Table of Contents and Bibliographies of recent books, synthetic monographs, and seminal works which have become the reference points in France and in Italy. The air war is practically absent in F. Cochet, *La Grande Guerre. Fin d'un monde, début d'un siècle* (Paris, Perrin 2014); and has only a very marginal place in M. Isnenghi, G. Rochat (eds.), *La Grande Guerra* (Bologna: Il Mulino, 2008) (1st ed. La Nuova Italia, Florence, 2000). In *L'Encyclopédie de la Grande Guerre* (Paris: Perrin, 2012) by S. Audouin-Rouzeau and J-J Becker (1st ed. Bayard, 2004) at over 1,800 pages, only one very brief entry mentions both planes and tanks; 2 articles totalling a dozen pages out of over more than 1,700, mention the air war in the two volumes of *La Grande Guerra: dall'Intervento alla "vittoria mutilata"* de la série *Gli Italiani in guerra. Conflitti, identità, memorie dal Risorgimento ai nostri giorni* (M. Isnenghi, D. Ceschin [eds], Turin: Utet, 2008).

- 3 Studies of transnational history of the First World War are not lacking: the pioneering J-J. Becker, G. Krumreich (eds.), *La Grande Guerre. Une histoire franco-allemande* (Paris: Tallandier, 2008), the work edited by N. Labanca, O. Überegger, *La Guerra italo-austriaca (1915-1918)* (Bologne: Il Mulino, 2014), the three large volumes edited by J. Winter, *The Cambridge History of the First World War* (Cambridge: Cambridge University Press, 2014), or the excellent work by A. Prost and G. Krumreich, *Verdun 1916* (Paris: Tallandier, 2015) –, however the papers from this dual-country conference here are the first attempt devoted to aviation.
- 4 He was also head of the *Brigata specialisti del genio*, an Italian Army unit created in 1884 that studied and built aerostatic and steerable balloons. See E. Lehmann, 'Maurizio Mario Moris', in *Dizionario biografico degli Italiani* (Rome: Istituto della Enciclopedia italiana, vol. 76, 2012).
- 5 L. Calderara, A. Marchetti, *Mario Calderara aviatore e inventore* (Florence: LoGisma, 1999); 'Mario Calderara. Pionnier et premier aviateur italien', in *Icare revue de l'aviation française*, 181, 2002/2.
- 6 Pseudonym of the aviator Jean-Louis Conneau.
- 7 *Relazione circa la richiesta di assegni per la costituzione di nuove squadriglie di aviatori*, 15 novembre 1912, Ufficio Storico Stato Maggiore Aeronautica Militare (USSAM), Fondo Primordi. About the *Battaglione aviatori*, see E. Lehmann, *La guerra dell'aria. Giulio Douhet, stratega impolitico* (Bologne : Il Mulino, 2013), 19-32.
- 8 I. Guerrini, M. Pluviano, *Francesco Baracca. Una vita al volo. Guerra e privato di un mito dell'aviazione* (Udine: Gaspari, 2000), 26-30, 41-46.
- 9 On Longoni and his weekly, see E. Lehmann, *Le ali del potere. La propaganda aeronautica nell'Italia fascista*, (Turin: Utet, 2010), 5-75, 125-136.
- 10 'Piccolo dizionario di espressioni aviatorie', *La Gazzetta dell'aviazione*, 4 January 1921, 1. Trans. E. Lehmann and C. Johnson.
- 11 F. T. Marinetti, F. Azari, *Primo dizionario aereo italiano* (Milan: Editore Morreale, 1929).
- 12 *Ibid.* 9. Trans. E. Lehmann and C. Johnson.
- 13 *Ibid.* 155. Trans. E. Lehmann and C. Johnson.
- 14 E. Lehmann, *Le ali del potere... op. cit.* 261-68.
- 15 Planes designed by the Franco-British Aviation firm founded at Argenteuil in 1913 by French engineer Louis Schreck.

- 16 From the report by the *Technical Office for Military Aviation* (production office) 28 February 1919, titled 'Sviluppo della produzione aviatoria militare nel quadriennio 1915-1918'. The text and the accompanying statistical tables can be found in the collective volume, *La grande guerra aerea, 1915-1918. Battaglie, industrie, bombardamenti, assi, aeroporti* (Valdano: Gino Rossatto Editore, 1994), 323-36.
- 17 1,300 planes and 1,100 airplane engines according to the statistics in P. Facon, 'La coopération aéronautique franco-italienne pendant la Grande Guerre', *Revue historique des armées*, 252, 2008, 86-95.
- 18 E. Chadeau, *L'industrie aéronautique en France 1900-1950. De Blériot à Dassault* (Paris : Fayard, 1987), 129.
- 19 'Diary of Gianni Caproni, August 1918', 214-226 (Maxwell -Alabama: United States Air Force Historical Research Agency [AFHRA]), roll 168.66. The original is in the possession of Caproni's descendants.
- 20 E. Lehmann, *La guerra dell'aria... op. cit.* 96-97.
- 21 'Telegrams on 21 May and 15 July 1918' (AFHRA), roll 168.66.
- 22 'Rapport sur les travaux de la commission de l'armée pendant la guerre 1914-1918 (aéronautique)', by M. d'Aubigny (Paris: Imprimerie de la Chambre des députés, 1919), 36, cited in P. Facon, 'La coopération aéronautique franco-italienne pendant la Grande Guerre', *Revue historique des armées... op. cit.* Trans. E. Lehmann and C. Johnson.
- 23 E. Chadeau, *L'industrie aéronautique... op. cit.* 435.
- 24 Report by the Direction technique de l'aviation militaire (bureau de la production) 28 February 1919, titled *Sviluppo della produzione aviatoria militare nel quadriennio... op. cit.*
- 25 Archivio centrale dello Stato (ACS), Rome, Presidenza del consiglio dei ministri, prima guerra mondiale, 19/22, b.193: *Appunti sulla smobilitazione e dopoguerra dell'Aeronautica*. This thirty-one page document, from the Central Aviation Department of the General Commissariat of Aeronautics (part of the Arms and Munitions Ministry) was classified as 'very confidential'. A footnote on the cover page stated that all copies were numbered and had been distributed to the directors and heads of the Commissariat. I consulted copy 103.
- 26 E. Chadeau, *L'industrie aéronautique... op. cit.* 84.

27 On this point, the French case is well-explained in E. Chadeau, *L'industrie aéronautique... op. cit.* 98-117; for Italy, see the report by the parliamentary inquiry commission set up in the aftermath of the war: Atti parlamentari, legislatura XXVI, sessione 1921-1923, Camera dei deputati, 'Relazione della commissione parlamentare d'inchiesta sulle spese di guerra per l'aeronautica', 6 February 1923.

28 ACS, Presidenza del consiglio dei ministri (1920), 1/1/1054, b.579.

29 ACS, dossier cited, annexe A, 1.

30 Former head of the Inter-Allied Aviation Department, he held this office Jan.1920- Feb. 1921.

31 E. Chadeau, *L'industrie aéronautique... op. cit.* 156.

32 ACS, *Appunti sulla smobilitazione e dopoguerra dell'aeronautica*, dossier cited, 7.

33 E. Chadeau, *L'industrie aéronautique... op. cit.* 158.

34 *Ibid.* 161.

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