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SOME NOTES ON EARLY BALKAN AVIATION HISTORY (1912–1913)¹

Contrary to established opinion the first Air War with opposing Air Arms and their rudimentary staffs and ancillary services was fought not over the Western Front but over the Balkan Peninsula. During the Balkan Wars (1912–1913) all warring countries except Montenegro used aeroplanes in anger. Due to wartime pressure they were compelled to use representative (modern and outdated) examples of the then available aviation technology creating hurriedly from scratch an embryonic infrastructure for their adoption. Why was it that the transformation of the contemporary nebulous air power theory to practice was attempted in a region barely touched by the march of modernity, in lands former or still under the jurisdiction of the Sublime Porte?

This paper attempts to answer that question by focusing mainly on the intermediaries and the overall context and less on the Air War: the public attitude to the aeroplane before its appearance, the institutions that accepted the aeroplane as a weapon of War; the training through which flying and technical skills were acquired; and the materiel itself highlighting the „imported” elements of know-how, people, and machines.

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The Balkan Peninsula owes its name to the Balkans mountains massif, in today's Bulgaria. There are various definitions² of which countries

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- 2 In the interwar years Yugoslavia, Greece, Romania, Turkey, Bulgaria and Albania were considered Balkan countries. The Balkan Pact (Athens, February 1934) that was signed by the first four countries invited also Bulgaria and Albania to participate. If one accepts this version like this author, one needs only to substitute for Yugoslavia the successor countries that were formed after the dissolution of Federal Yugoslavia in 1991. However, according to Le Petit Larousse Illustré, 1993, Romania is excluded from the Balkans. The Encyclopedia Britannica CD, 1998 includes also Moldova, includes Greece in the Balkan Peninsula (but excludes it mysteriously from the Balkan Region), and also excludes Turkey stating that 'Turkey is not a Balkan state'. The Compton's Interactive Encyclopedia CD, 1998 includes also Romania but excludes Moldova. These and other similar differences of opinion are cited in Cioroianu, 'The Impossible Escape', 210–211. For this paper's purposes only Bulgaria, Serbia, Greece, and the Ottoman Empire need to concern us. It is interesting that although modern Turkey was founded in 1923, in most contemporary (1912–13) Greek newspapers the term Turkey is used instead of the technically correct term Ottoman Empire.

belong or do not belong to the Balkans varying mainly on geographical or cultural criteria. Any student of the region's fascinating history is invited to form his own prejudices based on the vast corpus³ of scholarly literature, travelogues, partisan writings and eventually his own personal experience. The Balkans were conquered by the Ottoman Empire in the 15th Century. The decline of the Ottoman system of governance during the 18th Century gradually eroded the Sultan's rule over its subjects. Major insurrections in the 19th century coupled to the intervention of the so-called Great Powers led to the establishment of nation-states in the form of the kingdoms of Greece, Serbia, and Montenegro, Bulgaria. In the beginning of the 20th century the part of Europe still under Ottoman control was contested by all the above countries.

In March 1912, a secret military pact between Serbia and Bulgaria divided northern Macedonia then under Ottoman rule, between those two countries. Arbitration on disputed territory was entrusted to Imperial Russia. In response Athens signed bilateral pacts with both neighbors. Essentially, the three Balkan powers thus agreed to cooperate militarily against the Ottomans, but they did not agree on the question of how to allocate territory surrendered by the Ottoman Empire. The coalition was joined later and by Montenegro (October, 1912). The so-called Balkan League was a shortlived triumph of Balkan diplomacy, as it was then thought as unlikely that the conflicting interests of the countries concerned could be accommodated within an alliance. Especially Greek and Bulgarian interests collided sharply over Macedonia. The two countries had fought each other by proxy, in a clandestine guerilla campaign in Ottoman-held territory that lasted for five years (1903–1908).

The Balkan powers initiated the First Balkan War⁴ after mobilizing approximately 710,000 troops and then declaring war on the Ottoman Empire in the beginning of October 1912. The armies of all four allies fought mainly to gain a favorable position in the postwar arrangement. After an armistice (October, 17-January 23) that was not signed by the Greeks, the first Balkan War was concluded with the May 30, 1913 Treaty of London. The Ottoman Empire ceded all its European possessions to the Balkan allies, with the exception of Thrace and Albania, the latter of which became independent. The second Balkan War broke out in June 13. Bulgaria attacked first Serbia because she had captured most of the Macedonian territory claimed by Bulgaria. A secondary trust was aimed at the Greeks. In the ensuing one-month war Bulgaria was attacked in turn by the Ottoman Empire and Romania. As a result Bulgaria suffered defeat at the hands of her former allies and lost much of what she had been promised in the initial partition scheme. This outcome was codified with the treaty of Bucharest

3 For an introduction to this vast body of literature, see Todorova, *'Imagining the Balkans'* and Goldsworthy, *'Inventing Ruritania.'*

4 For a recent overview of the Balkan Wars 1912–13, see Hall, *'Balkan Wars.'*

(August, 1913). The changes made in the map of Europe by the Balkan Wars of 1912–1913, were not merely the occasion but a cause and probably the most potent, of all the causes that eventually led to the World War I.

The conflict was largely fought with large conventional land forces, very similar to those that appeared later in WW I. Neither side had the mass of materiel available to the WW I combatants, and so no stalemate resulted. Warfare was relatively fluid in spite of the appalling state of the roads and the poor railroad network. Military technology used was a curious mixture of antiquated, established, and novel hardware. Aviation belonged to the last category. In fact there were two kinds of aviation technologies available: the older lighter than air machines (Balloons and kites) and the untried motorized aeroplanes. Aviation played no significant part in the conflict although the numbers of aircraft involved were by no means insignificant for the period under study. Totals of aircraft delivered until the cessation of hostilities in July 1913 is: Ottoman Empire 18/290000, Greece 11/110000 (including one civil example impressed by the Army complete with the owner who was offered an Officer's commission), Serbia 10/230000, Bulgaria 29/350000. These numbers can be compared with the inventories available to United Kingdom(29), Italy(26), Japan(14), USA (6) in 1914⁵, prior to WW I.

The numbers after the brackets refer to mobilized troops respectively. As David Edgerton has shown⁶, pre- 1914 aeroplanes strength should better not be compared in absolute numbers but in terms of the sizes of each army and navy, since aircraft were supposed to provide them with reconnaissance. Although it has been stated that only Greece 'possessed a Navy of any number and strength'⁷ the Ottoman Navy was actually larger in tonnage. But only the Greeks enjoyed exclusive use of seaplanes (3 examples) and used them at least once in Wars. They converted also a Farman VII to a seaplane before the Wars, replacing the wheels with locally designed floats. It is reported⁸ that they held with it the World seaplane speed record for two months.

The nascent Balkan Air Arms were generally provisional and amateurish organizations and few resources were devoted to them. However, in spite of these retarding factors, under wartime pressure the Balkan aviators invented most tactical elements of later day Air Warfare. The Bulgarians contemplated even Air-to Air combat⁹, although no contemporary aeroplane was designed for that role. Thus, those responsible for aviation not only succeeded in introducing a new technology, but also transformed for the first time in history, aeroplanes to usable instruments of War.

5 Numbers quoted in Holley, 'Ideas and Weapons', 29.

6 Edgerton, 'England', 10.

7 Hall, Balkan Wars, 17.

8 HAFGS, *Istoria tis E.P.A.*, 45.

9 Nedialkov, 'Air Power', 49.

The complex relationship between the Military and Technology has been the subject of many studies especially from an American perspective.¹⁰ For linguistic reasons the mainly Anglo-Saxon literature¹¹ is more accessible to a European than works on the same subject, written in the lesser known European languages. European developments are being addressed gradually but as for the Balkans region, a thorough historical study of military technology is still in its infancy.

Bulgaria, Greece and Turkey have published official histories¹² on the formative years of their Air Forces. Aviation technology is obliquely referred to in the official histories, participant's memoirs and rarely in non-aviation related histories. Secondary literature with a historical slant towards aviation tends to be written by retired military personnel or journalists but contains useful information buried under the layers of the usual sensationalist/nationalist descriptions.

The Military was in that region in the past the sole user, consumer and beneficiary of certain technologies. It was also the main force behind their adoption, as local industry didn't have the required capital nor the resources or simply was not interested in them. The last point is valid not only for dual use technologies. Aviation technology is one of the many modern technologies introduced in the Balkans by the Armed Forces. Examples in Greece¹³ include steamships (1827), wireless (1907), lorries (1900–1912), narrow gauge railways (1916–1918), radar (1940) and mainframe computers (1961), to mention only dual use technologies. In all the above cases, the agent for their introduction, utilization and in most cases eventual dissemination to the civil sector was some branch of the Armed Forces. The large number of conscripts and Non Commissioned Officers that were trained in their handling transferred upon completion of military duty their specialized skills to the work market.

Aviation is a typical case. The Greek Faliron Aircraft Factory (1925) was founded initially by the military Ministry of Navy with technical assistance from the British firm Blackburn. In 1938 it was nationalized and became one of the larger (with more than 1000 employees) and most up to date factories in Greece. The establishment of a Air Ministry in 1929 (with a civilian minister) was also dictated by military priorities: the need to found a third institution responsible for a unified Air Force. Neither the Army nor the Navy under their respective War and Navy ministries wanted to part with their respective Air Arms. Another role for the Air Ministry was to bring in being an umbrella organization responsible for both

10 The standard texts remain Smith, *'Military Enterprise'* and McNeill, *'The Pursuit of Power'*.

11 For a review see Roland, *'Technology and War'* *'The Historiographical Revolution of the 1980'* and Hacker, *'New History of Military Technology'*. For a recent update see Hacker, *'The Machines of War'*.

12 BDE, *'voenata aviatsia'*, HAFGS, *Istoria tis E.P.A.*, and Kansu et al, *'Havatsilik'*. All the texts in Balkan languages, both official and unofficial, are of inconsistent quality. One of the best is Vujovich's semi-official *'Srpska Aviatika'*. This publication is, to the author's best knowledge, the only edited volume on aviation history, ever written in a Balkan language.

13 Vogiatzis, *'War material'*, 15–19.

Military and Civil aviation, as the former management of Civil Aviation by the Ministry of Communications was considered inefficient. The Ministry's contribution in fostering Civil Aviation in Greece was crucial. A government-owned civil airline was set up, staffed by ex-military pilots and mechanics. Until at least WW II, all aviation personnel involved in technical trades were either in the Military or were former military trainees.

Consequently, the technological history of pre-war Aviation in Greece is part and parcel of Service history. But the history of all Balkan Air Forces well into the 20th Century is criss-crossed by violent changes caused by political upheavals, coups d'état, civil wars and foreign invasion. Purges that led to involuntary postings or premature retirement of personnel were common. In this very turbulent context, technological developments, however noteworthy, fade into apparent insignificance. In an attempt to understand how the archetypical of the technologies of modernism became entangled in this very idiosyncratic setting it is necessary to look for first beginnings.

Airmindness is a pre-1914 phenomenon. It was nurtured by a widespread body of predictive literature, both fiction and predictive theory, established in the 19th Century. Air Leagues, Aero Clubs and organized lobbies promoted public awareness, opened subscriptions and generally pressured recalcitrant government and military authorities to further the cause of Aviation. Good treatises on Britain, Germany and France endow the relevant literature on airmindness in Western Europe.¹⁴

The official attitude to the aeroplane in the West has been hotly debated ever since¹⁵. Barring oversimplifications, there is a consensus that the most timid military staffs can be blamed for many things but for technological conservatism. They financed projects that proved technological dead ends like the Langley Aerodrome (USA), Ader's Eole (France), the Airship 'Mayfly' (Great Britain) or the French armoured aeroplanes of early WW I. Given the very limited capabilities of airships and aeroplanes before 1914, the question that still begs an answer is how to explain the considerable interest shown in the various national contexts. Contrary to the popular legend circulated by aviation propagandists to pressure their respective governments, the military authorities were interested in the new technology. They had a hard time in assessing the various offers put forward by individual 'inventors' who usually demanded a fortune for their products.

Looking at the Balkans, one is immediately struck by the fact that large segments of the urban populations were thoroughly accustomed to flying machines thanks to the services of itinerant pilots-entrepreneurs. These pilots-cum-showmen performed flying maneuvers before ticket paying crowds who flocked to see them fly. Aeroplanes and balloons were considered then a curiosity. The names of Utoskin (Athens, 1909, aeroplane) Simon, Maslenikov,

14 Paris, *'Winged Warfare'*; Fritzsche, *'German Aviation'*; Wohl, *'A Passion for Wings'*.

15 Kennet, *'Air War'*, 1–22; Edgerton, *'England'*, 1–17; Morrow, *'Great War'* 1–57.

Cermak, Vidmer (Belgrade, 1910/1911, aeroplane), Godard (Plovdiv, 1898, balloon), Maslenikov (Sofia, 1910, aeroplane), Barbotte (Istanbul, 1909, balloon), de Caters, Bleriot¹⁶ (Istanbul, 1909, aeroplane), Jones (Istanbul, 1912, aeroplane), all of them Slav and Anglo-French pioneer aviators, are known. Additionally, a small cadre of local pilots both officers and private individuals performed regularly in similar Air Shows for the public's sake. The funerals of two of the latter, victims of flying accidents were declared days of national mourning in Serbia (January, 1911) and Greece (August, 1912).

The first volume of the Greek Official Military Aviation history coins the term 'Year of Aviation' for 1912 noting¹⁷ the widespread pro-aviation agitation of the Athenian Press. A look at other Balkan papers conveys a similar impression. An appeal to the 'responsible officials' to train pilots in time as 'they can't be created overnight nor can be ordered by some factory' appears in the major Belgrade newspaper as early as November 1910¹⁸ pointing to the fact that in wartime without prior training, not enough pilots will be available. The Bulgarian paper "Rets", reportedly reflecting the views of the High Command, writes: 'Aeroplanes are of the greatest value for the Army especially at wartime. With their help it would be possible without other means to destroy transportation nodes, especially bridges'.¹⁹

Most known newspaper references from all Balkan papers are strikingly similar in their bellicose language. One is hard pressed to find a statement exhorting the technological virtues of aircraft or evoking modernist visions.

There is some evidence of Royal Patronage towards Aviation. This royal support for Aviation persisted well into the thirties. The Serb King Peter I overruled²⁰ in a crucial cabinet meeting General Stepan Stepanovich (Commander in Chief of the Serbian 2nd Army during the Balkan Wars), who disagreed to the proposed foreign Aviation training of officers. Both the Bulgarian Czar Ferdinand I and the two Princes Boris and Cyril took rides in aircraft in 1910 and the same did (Ottoman) Prince Celalledin in 1913. The PR value of aircraft was then lost on the Royal House of Greece but not on Greek Premier Eleftherios Venizelos, who preceded Churchill's similar exploits by a year, flying as a passenger in February, 1912. His speech delivered after that flight is one of the earliest statements concerning the use of Military Air Power ever made by any Statesman:

„The aeroplane is suitable as a weapon of the weak. The audacious and daring nature of the Greek will transform it to a splendid weapon of War capable of rendering great services.”²¹

16 For an excellent description of the experiences of one of these foreign aviators during the visits in the Balkan cities, see the article about Bleriot's flying display in Istanbul, see Leiser, 'Dawn of Aviation'

17 HAFGS, *Istoria tis E.P.A.*, 32.

18 Beograd, *Politika*, 30 December 1910.

19 Sofia, *Rets*, 15 September 1912.

20 Janic, 'Nastanak', 16.

21 HAFGS, *Istoria tis E.P.A.*, 22.



The Balkan Air Leagues and their subscription campaigns merit a monograph on their own. They were established earlier than similar British organizations²² and covered the cost for the majority of aeroplanes (at least in Greece and the Ottoman Empire). The Donanma Cemiyeti (Fleet Society) modelled after the German Flottenverein to support the sharp Greek-Ottoman Naval Race embraced Aviation too: An Ottoman Lady named Belkis Sevket, incidentally cofounder of the Organization of Defending the Women Rights, (a pioneering Muslim feminist organization) is noted throwing leaflets over Istanbul from of a Deperdussin in support of the Fleet Society's campaign²³ in 1913. She was perhaps the first woman-passenger of Balkan provenance. The most successful fund-raising campaign, by any standards, was waged by a Greek man of letters, who allegedly raised single-handedly money from patriotic Greek-Americans, for a Stettin-built 680 ton destroyer, an artillery battery and three aeroplanes²⁴.

The prevalent attitude to the aeroplane is best summed up in the motives behind the first locally produced aircraft in the Balkans: it was ordered not by the Army but by prospective volunteers who want to fight side by side with the regular Army. It was built in the workshop of a Serb aviation pioneer, and it was destined for irregular warfare, to support guerilla bands fighting in 'unliberated Serbian lands'²⁵. It was delivered in May 1912 to its owners but damaged due to inept handling, without harming anybody, much less the enemy. As a matter of fact irregular formations formed of civilians with or without official sanction, fought alongside all armies, later in the Wars.

On the eve of the Wars, all Balkan armies shared many similarities. They were organized according to the European General Staff model (except Montenegro). They all followed European models for training, logistics communications and sanitation²⁶. They relied on conscript armies of mainly illiterate peasants but equipped with state of the art European weapons. Foreign training was not only a privilege of the higher Officer Corps. Middle or low rank officers, mainly specialists, were sent to training courses abroad. Members of foreign military missions were given great latitude to do their work, inflated local military ranks (in Greece and the Ottoman Empire) and a place in the Official Officer's Rank List that is used to regulate promotions (at least in Greece). From articles in the official military magazines, it is evident that world developments in tactics and weaponry were followed closely. The enthusiastic and simultaneous use of wireless, torpedo boats, machine guns, submarines, sea mines by some or all the combatants during the Wars, reveals a military culture very open to innovation. The existence of such a military culture was conducive to the

22 aris, 'First Air Wars', 104.

23 Diven, 'Guide Book', 18.

24 Rouskas, 'Spyros Matsoukas', 144.

25 Janic, 'Nastanak', 15.

26 Hall, 15.

adoption of promising by most contemporary western accounts new weapons such as aeroplanes and airships. Another contributing factor was the minuscule cost of Aviation material compared to the heavy burden of the Greek or Ottoman Naval Estimates and the overall cost of the Balkan arms race. Experimentation with tactics and equipment was practiced in maneuvers. Relevant here is the opinion of Vice-Admiral Mark Kerr, Head of the British Naval Mission in Greece (1913–15):

‘Within one year of our arrival and before the Great War commenced, the Greek Navy was the only maritime Service in the World who was practicing in maneuvers the hunting of submarines by seaplanes and destroyers in combination and was making arrangements for catching underwater pests [submarines, author’s note] in steel nets.’²⁷

Kerr was typical of the air-minded middle-aged officers like the British Trenchard and the Austrian Uzelac, who taught themselves to fly in order to command the first military aviation units. During WW I he became one of the early proponents of Strategic Air Warfare, and played no small part in the establishment of the first independent Air Force, the Royal Air Force.

The formal institution of the respective Balkan Air Arms is not given the attention it deserves in the available accounts. According to the first volume of the Greek Official History, the establishment of an Aviation Section (under the Corps of Engineers) was based on a recommendation by the French Military Mission that was received with ‘alacrity’²⁸ by the War Ministry. The Mission led by General Joseph Eydoux arrived in Athens in January, 1911 and was assigned the task of radical reorganization of the Greek Army. The members of the Mission were not mere advisors, they were given Greek military ranks and actually commanded military units during multiple and very intense exercises held before the Wars. (However, they were forbidden to take an active part in the Wars). Unfortunately, the author of the above recommendation is unknown, as the two Engineer Officers included in the Mission’s complement were assigned not to aviation related work but to traditional Corps of Engineers tasks²⁹. Similarly the Ottoman Aviation Section was placed under the General Inspectorate of Technical Troops and Fortified Places and its inception (July, 1911) credited to the initiative of Ottoman War Minister Mahmut Sevket Pasa³⁰ (1856–1913). Both the Bulgarian and the Serbian Aviation sections were formed formally after War broke out in September, 1912, the first under the Corps of Engineers, the second directly at the disposal of the High Command³¹. Both armies operated balloons from 1906 and 1909 respectively, and aeroplanes were received and used before the formal establishments of

²⁷ Kerr, *Reminiscences*, 181.

²⁸ HAFGS, *Istoria tis E.P.A*, p. 26.

²⁹ Laroche, ‘Mission Militaire’, 179.

³⁰ Diven, ‘Guide Book’, 23.

³¹ Janic, ‘Nastanak’, 22.

Aviation Sections. The attachment of these sections to the Engineers reflects the French practice of the time. In the Greek case, it was a rather nominal subordination. Only the name of the Engineer Officer in charge is known who subsequently disappears from all accounts. The fragmentary archival sources unearthed in the Hellenic Army historical archives bear the signatures of Premier/War Minister Venizelos and Navy Minister Stratos and some concern very mundane matters. On the other hand they suggest that in the Greek case at least, aviation was considered important enough to trouble heads of Government and cabinet members. This lack of data regarding the proper chain of command above the Aviation Section level (it was a company level formation—a battalion consists of three companies), does not allow us to place the Greek Aviation Section in its proper military context. The subordination of a military unit reveals a lot about its function and its relative significance. For example the Bulgarian chain of command is given³² as follows: Army General Staff>Engineering Troops>Railway Regiment>Aeroplane Parc (a support unit that collected all airplanes)>aeroplane (4) or balloon detachment (2).

It is a pity that so few original accounts of flying pre-1912 airplanes have survived. Aeroplanes between 1909–1912 were really a generation apart from early WW I examples, as they had much more demanding flying characteristics. The flying characteristics of these aircraft cannot be compared in a meaningful way, even with interwar aeroplanes, not to speak of today's light propeller aeroplanes. The physical effort to stay aloft in such a machine is today underrated while their potential is usually overrated. The main points of contention were power and control. Almost all were notoriously underpowered, the average output being 50 hp and thus very prone to the ravages of weather. Also in those days every manufacturer used his own unique system of flight controls. Wing warping as pioneered by the Wrights was one of the many possible configurations with many permutations. The situation was further exacerbated by different cockpit controls³³. (Control over flight controls used in production aeroplanes was the point behind the Wrights yearlong litigations over patents with Curtiss and others). This profusion of control systems meant that when somebody learnt to fly on a type of aircraft, he was not automatically capable to fly on another type³⁴ as it

32 Nedialkov, 'Air Power', 36.

33 For a very informed discussion on flight controls of three different early aircraft see Taylor, 'Pioneer Aeroplanes', 137–158.

34 A surviving telegram sent from the Greek Premier Minister to Commander in Chief of the Army testifies to this. Venizelos complains to Crown Prince Constantine about a hired Italian Aviator who is incapable to fly in the Greek Farman biplanes and demands more practice. As this all happens at an advanced landing ground in the battlefield of Epirus, he recommends upon the suggestion of a Greek officer pilot that the Italian be barred from further flights. Telegram from Minister Venizelos, Athens to the Crown Prince, CinC, Vodena, 4 Nov 1912, File 1602/A/36, Hellenic Army General Staff Historical Service Archive, Athens. The hapless Italian who learned to fly in monoplanes, is not mentioned in the Official History volume. It is amazing that Prime

happens today with light aeroplanes. This factor undermined the value of any accomplished flying training. Flying early aircraft demanded constant attention from the pilot and proved very tiring as noted both by contemporary reports³⁵ and modern recreators³⁶.

The accident rate was high, a fact well known to a Serb Officer who disobeyed orders to report for Air Training when his superiors declined him the life insurance he requested³⁷. All the latter Balkan accounts written more than 50 years later treat training as the routine affair it became only after WW II. They generally mention the names of the officers who completed successfully the courses abroad: 4 Greeks, 13³⁸ Bulgarians, 6 Serbs (including three Non Commissioned Officers), 8 Ottomans (two as civilians at their own expenses). The Greeks decided not to train more officers abroad than the first four, because they wanted to transfer flight training in Greece. The majority studied in the private flight schools of the manufacturers Farman and Bleriot in Etampes, both near Paris. Most of the international pupils preferred the Farman school which offered tuition in double-control two seaters, but according to the experience of the Serbs who sent trainees to both, those sent to the Bleriot school were better trained³⁹. This was attributed to the exclusive users of one-seaters in training, a remarkable statement in view of later practices (during WW I, the British practice of using double-control two seaters for training was widely adopted and it is still in use). Two Bulgarian students demonstrated a method of landing with a dead engine that was subsequently incorporated in the Bleriot's school curriculum⁴⁰ proving that the learning process benefited both sides.

It is unclear whether the Balkan trainees benefited from the reorganization of the French training syllabus undertaken in 1911. Individual exploits that impressed the public were less important for the military than the abilities to follow orders, to fly in weather that civilians would not risk and to function as a team under a single command. The first aviators were required to possess civil flying certificates (Brevet civil) that were awarded after exams by the Aero Clubs and endorsed by FAI. (The Federation Aeronautique Internationale is a Swiss based, civil and sports aviation international organization that still supervises the national Aero-Clubs). Civil training offered by the Aero Clubs was deemed insufficient for military pilots and accordingly, a new military diploma (Brevet Superieure Militaire) was introduced that initially was passed by only 31 French pilots⁴¹. The

Ministers and prospective Kings delve on matters that in the next War will be handled by lowly officers and office orderlies.

35 aris, „First Air Wars”, 106.

36 Taylor, 'Pioneer Aircraft', 156.

37 Janic, 'Nastanak', 16.

38 Nedialkov, 'Air Power', 13.

39 Janic, 'Nastanak', 25.

40 Borislavov-Kirilov, 'Samoletite', 12.

41 Morrow, Great War...p. 15.

Greek trainees were required to pass both the civil and the military Brevet according to the official version of events. But in a report that predates the Official History, based on oral interviews from participants, the training given is described „as being out of military context” and the technical training as ‘negligible’⁴². All known Brevet awards bear civil FAI numbers: Fesa Bey 780, Yusuf Kenan 797, Mihail Petrovic 979, something that means perhaps that mostly civil training was accomplished. The inadequate training from a military point of view is reflected by the appeal of the Serb trainees to their Ministry of War to allow them to perform flights beyond 1000 m attitude to practice spiral descents with dead engines, as this was thought as a suitable method for an emergency landing in small fields⁴³.

The request was denied due to the worsening situation in the Balkans that led to the recalling of all trainees from France, irrespective of nationality. Training was continued at home with the help of the foreign volunteers who were willing to oblige (they were hired to act as pilots not trainers), as well as with irregular practice in military exercises. Both Greeks and Bulgarians are known to have imitated the French manoeuvres of Picardy, September 1910, (where dirigibles and aeroplanes first made their appearance) during the Attica (May, 1912) and Sumen (September, 1912) manoeuvres. Incidentally present, as an observer in the Picardy manoeuvres was Mustafa Kemal Pasha, the founder of modern Turkey, then a junior officer. He was prevented by a companion to undertake a familiarization flight in an aircraft that subsequently crashed.

Reflecting the western trend, the surviving accounts about the early aviators are mainly hairraising stories about pilots’ stunts. They form in fact the traditional flying personnel’s lore, recounted in squadron messes since the beginnings of military aviation, but because they are sensationalistic, some of them get collected and printed. On the contrary, relatively little has survived in written form about the mundane aspects of maintenance, servicing, and support infrastructure. We can extrapolate only backwards from WW I experience about the exact nature of the work performed by the „57 soldiers, 1 Naval Non Commissioned Officer, 1 French Mechanic”⁴⁴ who accompanied the three aeroplanes (one of them was captured as a war booty from the Ottomans) and two pilots sent by the Greeks to the Epirus Front. The corresponding Bulgarian support element for an Detachment (Otdelenje) of three aircraft is given as „62 men, 31 horses, 12 carts”⁴⁵. The Greek Section was moved about preferably by sea, while the Bulgarians depending on internal lines of communications were more mobile. They es-

42 ‘Report concerning the Action of the Hellenic Air Force(sic) in the Balkan War 1912–3’, Section 060/51–A; File 5222/A, Hellenic Air Force Historical Service, Athens, on page 2.

43 Janic, ‘Nastanak’, 18.

44 Telegram from Prime Minister Venizelos, Athens, to Commander Epirus Army, Arta, 18 November 1912, File 1626/A/4, Hellenic Army General Staff Historical Service Archive, Athens.

45 Nedialkov, *Air Power*...p. 15.

established base, forward, reserve landing grounds and dispersed POL (Petrol, Oil, Lubricants) facilities as well. Balloons present in almost all inventories needed hydrogen bottles that had to be imported and were cumbersome to transport. Only the Serbs produced hydrogen in a permanent filling station completed after long delays with imported Swiss machinery in Nish during the first months of 1913⁴⁶.

It would be misleading to treat the numerous foreign ‘volunteers’ hired by the Balkan governments in the 1912–13 as a body of aeronautical experts. The only thing they had in common was some form of flying training and/or proficiency as mechanics. In some cases they outnumbered the local aviation trained personnel by a wide margin. Also, if the Serbian example is typical, pilots were paid per day a Serb Non Commissioned Officer’s monthly salary⁴⁷. Numbers given in the table below are by no means definite:

	Bulgaria	Serbia	Ottoman Empire	Greece
Russia	4	1		1
France	2	3	2 (given Ottoman Army commissions)	2 (1 regular French Army officer, possibly, member of the Mission)
Germany–Austria	4		2	
USA	1		1	
Romania	1			
Switzerland	1			
Italy	1			1
Bulgaria	1	4		
United Kingdom	1			

Out of these pilots, some who served with the Bulgarians were technical representatives of aircraft manufacturing companies Sommer (Ernest Burie – France), Albatross Werke (Albert Rupp – Germany) and Bristol (Snowden-Hedley – UK). They did not necessarily take part in operations (Burie did), but their presence attests to the seriousness of the Bulgarian effort, which was the most thorough of all combatants. Also an unknown number of Austrian⁴⁸ and Russian mechanics assisted the Bulgarians. French aircraft mechanics were present in all countries. Some of the foreign pilots were dismissed after short service due to their incompetence (including all the pilots from western countries in Greece, 1 Russian in Serbia, 1 German in the Ottoman Empire). At least one of the foreign pilots (from the USA) changed sides and deserted from the Ottomans to the Bulgarians. Also of interest is that that Serbians employed 4 ‘Bulgarian’⁴⁹ pilots, and the Bulgarians one

46 Janic, ‘Nastanak’, 35.

47 According to a Belgrade newspaper, foreign pilots were paid 100 to 200 dinars per diem while a NCO’s monthly wage was less than 100 dinars. Foreign mechanics had to be content with 800 dinars per month. Beograd, *Vetserne Novosti*, 23 Jan. 1913.

48 The names of three mechanics from Vienna are mentioned in Avdis, ‘Protoporoi’, 117.

49 Janic, ‘Nastanak’, 24.

'Romanian' pilot (with a very Greek- sounding name) although their respective countries were enemies in the Wars.

Thus, the pursue of the very nationalistic war objectives of the Balkan combatants was observed by a decidedly cosmopolitan assembly of fliers and mechanics. Apart from their war service (as they were more experienced, they flew the more demanding missions) more relevant here is their performance as tutors. The first Aviation School in the Balkans opened in the first half of 1912⁵⁰ in Yesilkoy airfield in Istanbul and operated under German direction. The Frenchman Jules Vendrine (holder of the World speed record since September 1912) proposed to the establishment of a similar school in Nish, Serbia and trained local pilots himself. Others were less proficient. German Mario Scherff was sent home from Yesilkoy because he was not 'a successful teacher'⁵¹. The Greeks set up a technical school under the direction of a French mechanic⁵² (Mr.Chaveux) but the planned establishment of a Flying School was not accomplished until the end of the Wars. The Bulgarians acquired unexpected technical advice on photography by the local British war correspondents⁵³. Thus they were able to mount cameras on their aircraft, and perform regular photo-reconnaissance missions.

All Greek sources agree that the flying skills of the foreign pilots were worse than those of their own inexperienced pilots. In the Greek Official History volume, only one foreign pilot is mentioned (in fact there were at least three) who is subsequently dismissed, some time after quarrelling with a Greek Officer over the choice of a landing ground⁵⁴. He was the future Aviation Chief⁵⁵ of the French High Command (1915–1917), then Captain Bares. In Bare's 1994 biography it is stated⁵⁶ that Crown Prince Constantine did not approve of Bare's flying missions on behalf of the Greek Army, because he (Constantine) was pro-German⁵⁷.

Summing up, the Balkan countries benefited more from technical support and advice than from advice on flying proficiency. All countries relied heavily on the services of foreign mechanics that usually were hired in pairs with the corresponding pilot to service his aeroplane. Relatively

50 Nicolle, 'Ertugrul', 47.

51 Diven, 'Guide Book', 12.

52 Athens, Estia, 26 May 1912.

53 Nedialkov, 'Air Power', 28.

54 HAFGS, *Istoria tis E.P.A.*, 45.

55 Morrow, 'Great War', 63.

56 Castex *et al.*, 'General Bares', p.57.

57 This statement reflects perhaps WW I developments. King Constantine's position regarding Germany is a very important matter in Greek historiography. It is considered that his pro-German stance during the beginning of WW I did not allow Greece to join the Entente powers against Germany. He disagreed on this matter with Premier Venizelos and the ensuing dispute led to the great National Schism (Dichasmos) that polarized Greek political life throughout the whole interwar period. Kerr, who as the head of the British Naval Mission in Greece and Costantine's Naval advisor had many reasons to know Constantine's position, insists vehemently that he was not a Germanophile. Kerr, *Reminiscences*, 191–192.

few local mechanics were trained abroad, the most numerous group comprising of a dozen Greeks⁵⁸ that were sent to France like six Bulgarian colleagues. The Serbs didn't train mechanics abroad for reasons of economy. Mechanics were responsible for tending the temperamental, predominantly Gnome-Rhone rotaries that needed service after a few hours and their services were deemed invaluable. However, the very inconsistent quality of the foreign 'volunteers' due to the mercenary nature of their employment destroyed any semblance to a structured training program.

Lighter than Air machines were much in evidence in the inventories of the Balkan armies (except Greece), one year before the Wars: 1 spherical observation balloon, 1 captive Parzeval kite (Serbia), 2 Godard type balloons (one of them locally made from imported Russian materials), 1 unspecified type (Bulgaria), 1 Parzeval kite, one kite balloon (Ottoman Empire).

Captive balloons were permanently tethered to the earth to be used as observatories, and by 1912 these were mostly kite balloons (developments of the original 19th Century spherical balloons with a more refined aerodynamical shape). Dirigibles were essentially motorized kites that could travel on their own power. Since the second half of the 19th Century, the utility of balloons in War was taken for granted, an opinion shared also by the armies of Europe. They were used for observation, communication (during the siege of Paris in 1870–1), even as unmanned bomb carriers during the siege of Venice in 1841. In fact, during WW I lighter than air machines used, as captives were more important to the military effort as artillery observatories, than the better-known dirigibles used for bombing and long range reconnaissance. This cornucopia of today-defunct military aviation technology is a classic example of a technology that disappeared because a competing technology with similar purposes (military aeroplanes) finally prevailed.

Balkan use was constrained by the availability of hydrogen that was difficult to procure and transport and the scarcity of trained personnel (1 Serb and 2 Bulgarians officers were trained as balloonists in Russia before the Wars). Balloons and kites were supplanted, not replaced in use by aeroplanes, when they became available

However, during the Wars it was ascertained that aeroplanes were more useful from a military point of view than lighter-than air machines.

The use of aircraft was greatly constrained due to lack of spares and the high attrition caused by accidents. Accidents that led to total write-offs of aircraft were very common. Fatalities due to flying accidents, not enemy action were surprisingly low, totalling 4 for all countries including one civilian passenger. The victorious Balkans powers which were in the offensive, had the opportunity to supplant their aircraft strengths with captured

⁵⁸ They were low-ranking Army Non Commissioned Officers with technical specializations. Details about this little known foreign assignment are known only from contemporary newspapers, Athens, Akropolis, 22 March 1912.

Ottoman examples that were then re-used: 2 each were taken in charge by the Greeks and the Bulgarians, 1 captured during rail transit by the Serbs. Even with this unexpected addition, the end of the Wars reduced total aircraft strength to a third. The Bulgarians who had 29 aircraft, were left with 8 servicable aircraft by the time the second Balkan War started. Instructive is the fate of the 7 French R.E.P. aircraft used by the Ottomans as described in a report by Captain Mehmet Cemal⁵⁹:

'The 1st REP. It is a two-seater school plane. It cannot climb to more than 200 meters.

The 2nd REP. It is a single-seat trainer. Its cylinders cracked during trials and spares replaced them.

The 3rd REP. It is a ground rolling plane deployed for teaching cadets how to maneuver them on ground.

The 4th REP. It is a war plane. It was flown to Saloniki by Nuri and it was left there during the Balkan War.[It was captured by the Greeks and sent by boat to the Epirus front, author's note]

The 5th REP. It was used by me. While flying over Ayastefanos (Yesilkoy) its engine stopped. Necessary care for reconstruction was not taken.

The 6th REP. It was commanded by Nuri. It has no military significance since it cannot lift more than a single man.

The 7th REP. It was a war plane but it was confiscated by the Serbians.'

The aircraft referred to, as 'warplanes' are those that were powered with higher power engines and were capable of lifting two-men crews. According to a recent study concerning Turkish military aircraft, of the 6 REP aircraft 4 were withdrawn from use because of unrepairable engines, or other mechanical defects.⁶⁰

With the exception of dirigibles, Aviation material represented a fair range of the then available aviation technology ranging from the outmoded Slavic spherical balloons to the Ottoman DFW Mars biplanes, the most up to date aeroplane used by any combatant. The most numerous type used was the one seat Farman VII biplane. It appears both in the original French built version and the deficient in workmanship Russian-built version utilised by the Bulgarians. The type used by all sides was the Bleriot monoplane in its one seat 'Militaire' and two seat 'Artillerie' variants, one of the first aeroplanes with military designations given by the constructor. In all inventories the 50 hp Farmans and other aircraft with a similar power range were replaced wherever possible with higher-powered aircraft capable of transporting a second crewmember as an observer. It became apparent to all, at an early stage, that the single pilot that most early aeroplanes were capable to lift, had a doubtful military value. As reconnaissance was then the major mis-

⁵⁹ Sevel, Haluk, M., 'REP Pre WWI Period TUAFA Aircraft', October 2005, <http://www.tayyareci.com/digerucallar/turkiye/preww1/rep.asp>

⁶⁰ Nikolajsen, 'Turkish Aircraft', 7-8.

sion of aircraft, the need for a second crewmember trained for observation become urgent. Relevant here is an excerpt from the combat report of Greek Engineer 1st Lieutenant Moutoussis, who flew a combined reconnaissance/bombing, raid over the Ottoman Fleet anchorage in January, 1913:

‘Specialized observers should be trained for observation from aeroplanes as it is difficult if not impossible for the pilot to perform observation duties as well. Another[he flew before on behalf of the Army, author’s note] reconnaissance I accomplished in Naval Service gave far better results than the expected, because I had with me a special observer, an Naval Officer. That Officer[Ensign Moraitinis ,author’s note] managed to identify by name the position of the enemy’s ships.’⁶¹

The effect of this first known attack by aeroplanes against ships is described in the Turkish Official History volume, as a ‘15 cm crater in a field’⁶² a typical result for bombing missions in the Balkan Wars. Due to the low weight of the projectiles, ‘bombs’ were in fact glorified handgrenades.

Bombing was performed as a matter of routine by all combatants except the Serbs. The Greeks fitted wooden bomb releasing boxes for 4 x 0,5 Kg bombs to their early one seat Farman⁶³. The bombs are interesting, as they had cruciform tails to improve ballistics. Mention is also made⁶⁴ of Greek use of crude petrol bombs. The Bulgarians enhanced the capabilities of aeroplanes of various types with locally manufactured Velicko (light) and Gelgar (heavy) bombs, bomb releasing mechanisms and bombsights. Another experimental bomb type devised by one Lieutenant Petrov fitted with a surface action fuze, was reportedly⁶⁵ copied by the Central Powers during WW I. It became known as the ‘Chataldza bomb’ alluring to the name of one of the battlefields in the Bulgarian-Ottoman front. Its cratering effects revealed during tests are described as 4-5 m in diameter and more than 1 m in depth, a very reasonable performance, for the period under study. From the many improvised inventions devised during the Wars it is the only one known to remain in use after their end. It is noteworthy, that standardization and production status was achieved outside its place of invention.

It seems that all modifications on the imported equipment were initiated by service personnel pressured by wartime exigencies. That meant that it was at their Commanding Officers discretion to allow or disallow the experimentations. Testing was done by trial and error and every device was accepted on its utility value alone. Science and Industry are noticeably absent. The only person with formal scientific training, who is known

61 ‘Aviator’s Moutoussis Report on Action in Epirus’, File 1622/A/6, Hellenic Army General Staff Historical Service Archive, Athens, on pp. 6–7. The emphasis given to the significance of two-men crews is evident and in the Ottoman report mentioned before.

62 Kansu *et al*, ‘*Havatsilik*’ p. 138.

63 ‘Report concerning the Action of the Hellenic Air Force(sic) in the Balkan War 1912–3’, Section 060/51–A, File 5222/A, Hellenic Air Force Historical Service, Athens, on p. 3.

64 Avdis, ‘*Protoporoi*’, 109.

65 Borislavov – Kirilov, ‘*Samoletite*’, 36.

to have some connection with the Balkan modifications, did so reportedly because he was a friend of the pilot and because of his 'love of aviation'⁶⁶ not because of his qualifications. As there was no *modus operandi* to perform proper tests, write manuals and perhaps start industrial production, even the most useful from a military point of view device, was doomed to oblivion after initial use. Manufacture of bombs, bombsights, bomb releasing mechanisms, floats etc. was really a manual labour process. In fact, in the available accounts little information is provided on where and how they were manufactured. Even if they were produced in small batches like the Greek bombs made in the Athens Maltsiniotis powder factory 'under the supervision'⁶⁷ of an officer, they remained prototypes. The factory is used as a convenient place of manufacture, undertaken under the watchful eyes of the 'officer-inventor'. He could as well go to a foundry, or use the services of his military workshop if their facilities could be adapted for rapid manufacture. The development and innovation stages were never reached due to the lack of testing and approving agencies and anything resembling a defence industry. The last deficiency was not important at the time, as pre-1914 aeroplanes were the products of workshops not factories. Aviation could be hardly termed then an industrial enterprise.

The introduction of military aviation technology in the Balkan region in 1912–1913 was not subject to the more formal service and scientific tests usually associated with military hardware in the West. Also, there were no interservice rivalries, no discussion about the relative merits of aeroplanes and dirigibles amidst decision makers. No comparison can be made with the protracted and convoluted process noted in the Western armies between 1909–1912. The adoption of military aircraft was rapid, numbers rising from nil in early 1912 to 60 in one and a half years. This can be explained by the willingness of the Balkan armies to experiment with any military technology that could give a competitive edge over the neighboring countries, including aeroplanes. This is reflected in the overwhelming positive public reception, the aeroplane being hailed from the beginning as a weapon of War and an instrument for the liberation of oppressed brothers. Another contributing and perhaps crucial factor, can be found in the aircraft's structure. Pre-1914 aeroplanes were the products of workshops not factories. Extensive industrial infrastructure was not a prerequisite for building aircraft, not to speak of maintaining them. Aviation could be hardly described as an industrial enterprise in 1912–13, and thus it was suitable for the underdeveloped Balkan countries.

Flying skills were acquired through eager but inadequately prepared local trainees. Further tutelage was provided by foreign pilots who doubled also as combatants, with mixed results. The transfer of technical know-how, also ac-

⁶⁶ He was Dimitrios Hondros an Athens Physics University professor who helped with the pre-war Greek seaplane conversion. Kartalamakis, 'Ellinika Ptera' 38 and 46.

⁶⁷ HAFGS, *Istoria tis E.P.A...*, p. 36.

completed largely by foreigners sometimes by unorthodox means, was more successful. Spurred by the exigencies of War, imported equipment was improved or tailored to use, by sometimes very creative local add-ons. However, local inventions failed to get wider acceptance due to them being introduced strictly within a military framework. The Military's role was twofold: it facilitated through investments in training, infrastructure and material the introduction of a then very new technology and encouraged local modifications. However, it was unable to assess and standardize the latter. It also failed to develop a deeper understanding of the new technology due to a lack of suitable military departments, scientific institutions and industrial support. Later, these failings will be addressed by the creation of appropriate organizations which even today are directly or indirectly under military control. During WW I all Balkan Air Arms were reformed as clones of their respective Great Power Allies Air Arms, adopting their equipment, organizational structure and tactics. The very original experience of the proto-Aviation Sections of the Balkan Wars era was labeled then as backward or primitive, relegated to the scrapyard of History and thus largely forgotten.

This early 20th Century Balkan exercise in mastering a new technology offers perhaps a framework for understanding better, more recent developments. The coming of age of new nation-states in the postcolonial era coupled to the disappearance of restraints imposed formerly by the Cold War balances, have fuelled regional arms races in many less developed parts of the World. The new military technologies may be different, the problems associated with infrastructure, training, technical support remain the same. On both sides of disputed borders even the official rhetoric is strikingly similar to that used in the Balkans before the 1912–13 Wars.

References

- Avdis, Alexandros. *Oi Protoporoi* [The Pioneers]. Athens: privately published, 1972.
- Borislavov, Ivan and Rumen Kirilov, *Samoletite na Bulgaria, Tsast prva od Blerio do mesersmitt* [Aircraft in Bulgaria, Part one from Bleriot to Messerschmitt]. Sofia: Litera Prima, 1996.
- Bulgarian Ministry of Defence. *История на военната авиация на България*, [History of Military Aviation in Bulgaria]. София: Институт за Военна История, 1988.
- Castex Jean, Louis Laspalles and Jose Bares. General Bares, 'Createur et inspireur de l' Aviation. Paris: Nouvelles Editions Latines, 1994.
- Cioroianu, Adrian. 'The Impossible Escape: Romanians and the Balkans.' In *Balkan as Metaphor*, edited by Dusan I. Bjelic and Obrad Savic. Cambridge: The MIT Press 2002, 209–233.
- Diven, Isik, Colonel. *First Original Guide Book of Turkish Aviation Museum*. Yesilyurt, Istanbul: Turkish Aviation Museum, 1987.
- Edgerton, David. *England and the Aeroplane, An Essay on a Militant and Technological Nation*. London: Macmillan, 1991.
- Fritzsche, Peter. *A Nation of Fliers, German Aviation and the popular imagination*. Cambridge: Harvard University Press, 1992.
- Goldsworthy, Vesna. *Inventing Ruritania: The Imperialism of Imagination*. New Haven: Yale University Press, 1998.
- Hacker, Barton C., „Military Institutions, Weapons, and Social Change: Towards a New History of Military Technology“ *Technology and Culture* 35(1994): 768–834.
- 'The Machines of War: Western Military Technology 1850–2000'. *History and Technology* 21(2005): 255–300.

- Hall, Richard C. *The Balkan Wars 1912–1913, Prelude to the First World War*. London: Routledge, 2000.
- Hellenic Air Force General Staff. *Istoria tis Ellinikis Polemikas Aeroporias 1908–1918, Tomos 1* [History of the Hellenic Air Force, Volume 1]. Athina: Dieuthinsi Istorias Aeroporias: 1980
- Holley, Irving B., *Ideas and Weapons*, New York: Yale University Press: 1953.
- Janic, Cedomir, Professor. 'Nastanak, razvoj I dejstva srpske aviatike u periodu 1912–1916' [Institution, development and service of the Serb Aviation in the period 1912–1916] in *Srpska Aviatika 1912–1918*, edited by Vojislav Vujovich. Beograd: Muzej Jugoslovenskog Vazduhoplovstva, 1993.
- Jarrett, Phillip ed. *Pioneer Aircraft, Early Aviation before 1914*. London: Putnam Aeronautical Books, 2002.
- Kansu, Yavuz, Sermet Sensez and Yilmaz Eztuna. *Havatsilik Tarihinde Tirkler* [Turks in the history of aviation], Tsilt 1. Etimesgut: Hava Kuvvetleri Basim ve Nesriyat Midirligu, 1971.
- Kartalamakis Ilias, *Ellinika Ptera* [Hellenic Wings]. Athens: privately published, 1983.
- Kennett, Lee B. *The First Air War, 1914–1918*. New York: Free Press, 1991.
- Kerr, Mark. *Land Sea and Air, Reminiscences of Mark Kerr*. London: Longmans, Green and Co. Ltd., 1927.
- Laroche, Serge, Colonel. 'La Mission Militaire Francaise en Grece de 1911 a 1913'. In *International Commission of Military History, Hellenic Committee of Military History. Acta, International Symposium of Military History "Moudros '92" – Pavlos Melas '92" for the 80 Years since the Balkan War of 1912, Greece: 1992, 178–182.*
- Leiser, Gary. *The Dawn of Aviation in the Middle East. The First Flying Machines over Instabul*, *Air Power History* 52(2005): 26–42.
- McNeill, William H., *The Pursuit of Power. Technology, Armed Force and Society since A.D. 1000*. Chicago: University of Chicago Press, 1989.
- Morrow, John H. *The Great War in the Air: Military Aviation from 1909 to 1921*. Washington: Smithsonian Institution Press, 1993.
- Nicolle, David. 'Ertugrul The Bleriot and Osmanli The Deperdussin. Fledgling Turkish Military Aviation', *Air Enthusiast* 96 (2001):46–55 on p. 47.
- Nikolajsen, Ole. *Turkish Military Aircraft since 1912*. No place of publishing given: Dutch Aviation Society, 2005.
- Nedialkov, Dimitar. *Air Power of the Kingdom of Bulgaria, Part 1*. Sofia: Fark, 2001.
- Paris, Michael. *Winged Warfare, The literature and theory of aerial warfare in Britain, 1859–1917*. Manchester: Manchester University Press, 1992.
- „The First Air Wars-North Africa and the Balkans 1911–13“ *Journal of Contemporary History* 26 (1991): 96–109 on p. 104.
- Roland, Alex 'Technology and War: The Historiographical Revolution of the 1980's' *Technology and Culture* 34 (1993): 117–134.
- Rouskas, Ioannis, Captain. 'Spyros Matsoukas and the Contribution of the Greek Immigrants to the National Effort 1912–13' in *International Commission of Military History, Hellenic Committee of Military History. Acta, International Symposium of Military History "Moudros '92" – Pavlos Melas '92" for the 80 Years since the Balkan War of 1912, Greece: 1992: 142–144.*
- Sevel, Haluk, M., 'REP Pre WWI Period TUAf Aircraft', October 2005, <http://www.tayareci.com/digerucallar/turkiye/preww1/rep.asp>
- Smith, Merrit R. ed. *Military Enterprise and Technological Change, Perspectives of the American Experience*. Cambridge: The MIT Press, 1985.
- Taylor Dan, 'Flying Pioneer Aeroplanes'. In *Pioneer Aircraft, Early Aviation before 1914* edited by Phillip Jarrett. London: Putnam Aeronautical Books, 2002,137–158.
- Todorova, Maria. *Imagining the Balkans*. New York: Oxford University Press, 1997.
- Vogiatzis, Dimitri. *War material supplies of the Hellenic Army and the Greek Defence Industry 1935–1940*, M.A. thesis, University of Athens, 1997.
- Vujovich, Vojislav ed. *Srpska Aviatika 1912–1918*. Beograd: Muzej Jugoslovenskog Vazduhoplovstva, 1993.
- Wohl, Robert. *A Passion for Wings, Aviation and the Western Imagination 1908–1918*. New Haven: Yale University Press.

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Неке забелешке о историји ране авијације на Балкану (1912-1913)

Супротно утврђеном мишљењу први ваздушни рат супростављајући ваздушно наоружање и своје основне штабове и помоћне службе није се водио на западном фронту већ на Балканском полуострву. У току Балканских ратова (1912-1914) све земље у рату осим Црне Горе користиле су авионе у бесу. Због ратног притиска били су принуђени да користе репрезентативне (савремене и застареле) примере, тада на располагању, авио технологије стварајући на брзину ни из чега ембрионску инфраструктуру за своје усвајање. Због чега је трансформација савремене, нејасне теорије ваздушне снага у пракси била покушана у региону кога је ход савремености једва додирнуо, у бившим земљама или још увек под јурисдикцијом Врховне Порте? Ова студија покушава да одговори на то питање фокусирајући се углавном на посреднике и свеобухватан контекст а мање на ваздушни рат: јавни став према авионима пре његове појаве, институција које су прихватиле авион као оруђе рата обуку којом летење и техничке вештине се стичу; и само оруђе које високо расветљава „увежене” елементе, практичан начин употребе, људе и машине.

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Заметки об историји ранней авиации на Балканах (1912–1913)

Несмотря на устоявшееся мнение первая война в воздухе с противостоянием воздушного вооружения, контролем со стороны генеральных штабов и с опорой на вспомогательные службы состоялась не на западном фронте, а на Балканском полуострове. В ходе Балканских войн (1912–1913) все страны, вовлеченные в конфликт, (кроме Черногории) использовали самолеты в войне. Из-за обстоятельств военного времени они были вынуждены использовать все имевшиеся у них тогда в наличии (современные и устаревшие) образцы авиатехники, создавая ускоренными темпами на пустом месте эмбриональную инфраструктуру для их использования.

Из-за чего в регионе, лишь поверхностно затронутом током модернизации, в бывших или еще находившихся в составе Османской империи землях была предпринята попытка осуществления современной и еще не разработанной теории воздухоплавания на практике? Это исследование и пытается ответить на этот вопрос, фокусируясь в основном на проводников этой идеи, на общий контекст и лишь в меньшей мере на саму воздушную войну. Рассматриваются: общественное мнение о самолетах, до их появления на сцене войны; институты, которые продвигали самолёты, как оружие войны; способы подготовки, благодаря которым пилоты получали навыки полета и технические знания; саму использовавшуюся благодаря всем этим элементам технику; практический способ использования людей и машин.