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CONTRIBUTIONS TO THE HISTORY OF AERONAUTICS IN ROMANIA

Ph.D. thesis

ABSTRACT

This thesis is a consequence of the fact that the author has noticed the lack of data regarding the early aeronautics in Romania, especially until 1910, data that has been published in Romania or abroad. The author proceeded to a careful check of all the information related to early aeronautics in Romania, going back to their primary sources and where needed by critically interpreting their significance. The author aimed to document as completely as possible the development of aeronautics in Romania, considering that the aeronautic phenomenon has suffered a quantitative and qualitative ascendance similar to other countries. Step by step, we managed to get a set of complete information that can be regarded from an evolutionary point of view, with no significant missing points.

From this big amount of data, we have extracted and presented, using a sound scientific approach, some cases that represent major moments in the history of Romanian aeronautics, that were completely unknown until us. They are all presented in the first part of the Thesis, under the title: **A ROMANIAN CENTURY OF BALLOONS AND AERONAUTS.**

1. The first example is that of the Romanian (from Bucovina) **Iordache Cuparencu (1780-1844)** who left the village of *Călineștii lui Cuparencu* from Bucovina and settled in Warsaw. In 1806 and 1808, he conceived, built and raised into the air, during public demonstrations in Warsaw and Vilnius, hot air balloons, all these activities being unknown in Romania until we firstly presented them at the Romanian Academy in 1995.

We found the first information about this case in a chronology of the Polish aeronautics in 1988, which has shown that in **1806-1808: Moldovanian Jordaki Kuparentko** (our underline) **made in Vilnius and Warsaw four flights with a balloon. During one of these flights he reached the height of 3882 feet.** The author couldn't supply us with further information, and we have found more Cuparencu names in some Romanian bibliographies, but none Iordache.

By taking supplementary researches, we have found some pertinent information whose conclusion is that **in 1799, at Călineștii de Sus, there was a Iordache Cuparencu, son of Ion Cuparencu, nephew of Miron Cuparencu and grand-children of Vasile "cupar".** He received a certain area of land from his uncle Mihalachi Cuparencu, with the further note that in 1837, Iordache Cuparencu is no more mentioned as a land owner in Călinești.

On some pages of a "**Catechism**" (dated back in 1775) there are some notes of Iordache Cuparencu and other family members, our conclusion being that: **In 1796 Iordachi Cuparencu was the owner of this "Catechism"**, on which a certain Ștefan Cuparencu will note that, using this book my uncle **Iordachi Cuparencu** learnt and that it was given to him by **Iordachi Cuparencu.**

Some parochial records from the National Archives in Suceava, concerning the village of Calinesti and dated in 1805, mention at house No.89 the Cuparencu family (each member with his/her age): **Ioan (Nobel): 60; Ilinca (wife): 52; Gheorghii (son): 28; Luca (son): 26 and Iordachii (son): 25. From this note we may infer 1780 as the probable birth year of **Iordache Cuparencu.** In some other lists there are mentioned as nobles the three Cuparencu brothers: ... **Kuparenko Michael, Basil, Johan...** the last one being *Ioan Cuparencu – father of Iordache Cuparencu.***

In four Polish books on the history of aeronautics, [1956, 1957, 1968] there is mentioned also ... *the Moldovanian Kuparenko, ... Moldovanian Kuparentko (...decribed by some authors as Polish aeronaut), ... Moldovanian Jordaki Kuparenko ...* with his ascents in

the air. Two authors mention that during one ascent in the air, the balloon took fire and the aeronaut saved himself using a parachute.

The ascents in the air of Cuparencu were mentioned in two articles from *Gazeta Warszawska*. The first one (2.07.1808, p.877) – is an invitation to the public:

- Cuparencu presents in a public demonstration in Warsaw, at his third ascension, a new balloon, invented by himself. The first ascent was made in Warsaw in 1806, and the second one in Vilnius, at December 6, 1806, when he rose to a high altitude and covered a distance of approx. 2,5 km (short version of the article);

From the second (24.07.1808, p.980) – a reportage, we learn that:

- Place, date and hour of the third ascent: *Foksal* garden in Warsaw, July 24, 1808, 20.00 hours. During the ascent, Cuparencu took some altitude measurements (pressure) and temperature. He rose to an altitude of 3882 parisienne feet (approx. **1281 m**). An unexpected weather change made his balloon tore apart because of the wind and the balloon took fire from the heat source. The bottom of the balloon gallery served as a parachute, which he used and safely returned to the Earth (short version).

The article about *Kuparenko Jordaki*, published in 1864 in Warsaw, in the 16th Volume of the *Encyclopaedia Orgelbrand*, brought some essential data which we shortly present now:

- Born in 1784, when he was 15 years old he went to Iassy as painter in a theatre. He joins the moving acrobatics team of Kolter. Married Kolter's daughter. In 1804, he arrived to Warsaw with his team. Gives some acrobatics representations in 1576, Bracka street, we injured himself and renounced acrobatics for fireworks. In 1806, he conceives and builds a hot air balloon, with a heat source and a nacelle. The first public ascent is made in Warsaw (Foksal garden) in June 1806 when he arrives to St. Cross Church, then the balloon takes fire and he escapes. At the second ascent, in Vilnius, December 6, 1806, he used again a paper balloon. He covers a distance of 2.5 km and safely returns to Earth with his balloon. At the third ascent, in Warsaw, July 24, 1808, he raised into the air at 20 hours from the Foksal garden. He rose to an altitude of approx. 1281 m. The balloon took fire during the descent, but Cuparencu saved himself. In 1811, he joins the Polish army as a lieutenant. In 1827 he invented a complex musical device named „Buzuton” which he presents at an Exhibition in 1828. In 1830, he developed, presents and gives representations with the Mechanical Theatre. In 1842, he presents and gives representations with the new „Pitoresque” mechanical theater. Dies in 1844, at 60 years old. Buried in the Greek-Orthodox cemetery of Wola.

As regards the birth year of Cuparencu, mentioned above as 1784 and estimated by us to be 1780, further research in the Polish archives will clarify this point.

The aeronautical and artistic activities of Iordache Cuparencu confirm a very intelligent person, with exceptional practical abilities, all these being confirmed by his conceptions, technological and practical aspects.

An article on the history of the Polish Circus, posted on the Internet in 2006, says: ... *Jordaki Kuparenko of Romanian origin, but a native Warsawian by heart, who has inscribed himself in the annals not only as a lieutenant of artillery, but who was previously known by his entertainment activities.*

Without mentioning the names of the actors or the Theatre Company, two short announcements from *Albina Românească* (January 17 and 31, 1843, Iassy, Romania), using the syntagms **Teatrul mehanic** and **Fraișit**, made us believe that are related to Iordache Cuparencu and his Mechanical Theatre which he invented and developed in Warsaw.

The aeronautical events of the “Polish” Iordache Cuparencu have known an impressive international career. In a remarkable reference work, published in England in 1917, and reprinted in facsimile in 1972, under the title *JANE'S HISTORICAL AIRCRAFT from 1902 to 1916*, in a Chapter entitled *The earliest parachute descents 1783-1837 (by the*

Countess of Drogheda) the editor of this work mentions that: *Perhaps the most interesting of earlier descents was made on July 24th, 1808, by R. Jordaki Kuparanto, who ascended from Warsaw in a Montgolfière (or fire balloon) and narrowly escaped destruction through his balloon catching fire. He was, however, able to descend on his parachute, and this is certainly the first, and probably the only time till the twentieth century that a parachute actually proved to be a life/belt in the air*

The **Guinness Book of Aircraft**, another reference work, (edition of 1996 – p. 16, chapter *Balloons and Airships*) presents Cuparencu: ***The first man to survive the destruction of his hot-air balloon while in flight*** was R. Jordaki Kuparanto who, on 24 July 1808, baled out of a Montgolfier balloon that caught fire. Luckily Kuparanto had taken the precaution of ascending with a parachute as part of his equipment. On page 65, chapter *Parachutes, Kites and Gliders* one may read: ***The first man to bale out of a damaged aircraft with a parachute and survive*** was R. Jordaki Kuparanto who, on 24 July 1808, escaped from his Montgolfier hot-air balloon when it caught fire over Warsaw, Poland. We must underline that the both works do not mention the nationality of the aeronaut, but the place of the event.

The virtual encyclopedia **WHO'S WHO OF BALLOONING** published on the Internet by **Robert Recks**, mentions ***Kuparento, Jordaki – Poland*** – in the „MainBody” – mentioning: *FIRST to successfully use a parachute to save his life. Epic flight 24 July 1808 from Warsaw. Reportedly made a successful parachute jump from a burning „Montgolfier” balloon.* In Appendix A, Cuparencu is mentioned again in a list (including 471 names) entitled ***PIONEER AERONAUTS by Monk Mason 1783-1838*** (extracted from a book by Monk Mason, from 1838).

On the Internet, the name of Iordache Cuparencu and his event with the parachute appear in different forms (*Kuparenko, Kuparentko, Kuparento, Kuparanto, even Judaki [sic!]*).

To conclude, as a result of our thorough research, **in the history of Romanian aeronautics the name of Iordache Cuparencu (aprox. 1780-1844), from Călineștii lui Cuparencu (today's Călineștii de Sus) may be inscribed with honour. Cuparencu did in 1806 – in Warsaw and Vilnius, and in 1808 at Warsaw, public ascents with balloons built by himself. So, we may consider him as the first Romanian aeronaut who did conceive, build and make ascents with hot air balloons.**

So, it is necessary to reestablish the truth about the life and work of the Romanian **Iordache Cuparencu** by editing of a complete monography dedicated to his work.

2. The first mention on launching a balloon above the territory of today's Romania refers to a public show from 1816, for the birthday of “youngboy” Roznovanu, where a German launched a **lufbalon**.

In what regards the Romanian Land (Țara Românească) and Bucharest, from the information we have, we learn that, in Bucharest, in June 1818, at Dealul Spirii, probably with the King Caragea and his daughter Ralú as eye witnesses, some **Germans** have launched a round balloon with a diameter of approx. 8 m. made from linen using a heater with alcohol. This flight without a human on board has finished with a landing in the Cățelu village near Bucharest. Two ancient manuscripts published in 1936 mark this event, but there is a slight misunderstanding related to the date of the event (June 26, and June 9, 1818, respectively), while a third manuscript published in 1969 brings the third date: June 16, 1818. It is interesting to note that this last manuscript talks about a **German** in the balloon, this fact being mentioned since 1894. As the official records are missing, we tend to believe that the balloon was built on site, by a moving Theatre or Circus Company. It is quite possible that the author, constructor and the person who launched the balloon, could be even Romanian Cuparencu with/without his team, returned from Warsaw and he could have built also the “lufbalon” launched at the birthday of “youngboy” Roznovanu in 1816.

3. After the aeronautical show of 1818 with “bășica lui Caragea”, our researches have shown that, in 1844, Ioan Nicolini, named *outstanding pirotecnic and aeronaft* will have launched at the “Garden with horses” from Bucharest, a spherical balloon with a height of approx. 15m, which has risen to an altitude of approx. 2500m, being visible for 42 minutes. He made some demonstrative launches before that in Iassy (1837) and some fireworks in Slatina (1847). So, we may consider **Ioan Nicolini as the first professional constructor of balloons on today’s territory of Romania.**

In 1866, Nicu Movilă, pupil of the Military School in Bucharest, proposes two inventions, one of these being designated to solve the problem of the aeronautical navigation - *a Pegas* – and an electro-magnetical moving machine. The minister of resort names a commission of professors and engineers to examine these two inventions, but the inventor – fresh graduate of the School – does not defend them anymore. In 1867, Professor Emanoil Bacaloglu will address the Academy of Sciences from Paris a note related to a *proposal referring to aerial locomotion*, without any response.

July 1873 brings at Bucharest a series of outstanding aeronautical events. At July 15 and July 22, 1873, the Frenchman **Henri Beudet** – aeronaut and gymnast-acrobat – made two ascents with a hot air balloon. In August 1873, using his balloon, two locals make distinct additional individual flights: **Marius Willemot** – a Frenchman settled in Bucharest and respectively **Ioan Petrescu** – an employee at the Bucharest Townhall.

By his ascent of July 15, 1873, the French aeronaut **Henri Bueudet may be considered as the first aeronaut who used a lighter-than-air aircraft – a hot air balloon – to fly over the today’s territory of Romania.**

In August 6/18, 1873, **Marius Willemot make the first ascent in a balloon with a local inhabitant on board - this becoming the first ascent with a “local” aeronaut on board, from and over the territory of Romania.**

Still using the Beudet balloon, at the end of august 1873, **Ioan Petrescu becomes the first Romanian aeronaut to ascend in the air and navigate over the territory of today’s Romania**, and the story of his ascent – **the first aeronautical reportage published in Romanian.**

The ascents of Beudet, Willemot and Petrescu represent **the first series of major aeronautical events on the territory of Romania, with an important influence over the development of public interest and general concerns for aeronautics.**

4. In January 1874, Marius Willemot announces the intent to organize, in Bucharest, ascents and aeronautical travels. In March 1874, he left for Paris to receive and bring the **Michel le Brave/ Michaiu Bravulu balloon**, with a volume of 1500 m³ and which was ordered in France. The reception of the balloon takes place at the Gas Factory from La Villette, with an ascent to 2890 m, and the balloon and all the additional pieces are transferred by train to Bucharest.

The first ascent in Bucharest is scheduled for the same day as the inauguration of the Mihai Viteazul statue – May 10, 1874. Inauguration is postponed, and bad weather prevents the ascent of the balloon, which is exposed for visitors at Ateneul Român for a fee. The first ascent is organised in May 26, but strong winds will make this ascent impossible, which is again postponed for May 30. At the ascent, the rain makes the balloon heavier so there will be only one man, Grigore Ventura, joining Marius Willemot in the nacelle. They will rise to 3800 m and will land in Vărăști.

At the second ascent from June 9, on a nice weather, Willemot is joined in the nacelle by George Florescu, Demetru Călinescu and Ioan Const. Gr. Ghica. They reach 3000 m and land in Aprozi.

The third ascent, of June 20, having on Willemot and majors Poenaru, Lahovary and Dumitrescu on board, has as aim – besides altitude, temperature, humidity measurements - *to monitor the route and land recognition opportunities with a military perspective.* The balloon reach 2032 m, reach the Danube and land in the Prundu forest.

The last ascent will take place in July 7, 1874. There are two persons in the balloon: Willemot and Prince Ioan Const. Gr. Ghika. They reach 5180 m, and land in Goștinari.

There is an increasing interest for balloons and aerial ascents from an entertainment point of view. In 1875, appears the Carnival farce *Cucoana Chirița în balon (Ma'am Chirița in the balloon)*, by Vasile Alexandri, the place of action being marked very precisely by the author: ... *back at the Metropolitan Church, at ... the marketplace dedicated to balloon ascents 1874.* The balloon has a name with capitals: *Ciubâr-Vodă* and it was supposed to be built by Willemot. The show was given by the National Theatre for the benefit of Matei Millo – close to retiring – ad-hoc aeronaut. But ... during one of the last evenings, when the balloon was ascending on the scene together with the famous Chirița (played by Milo), the rope which was tightening the balloon tears. Milo fell out from a certain height, the public screaming...no serious injuries.

After 1875, we found no information about Willemot and the **Mihai Bravu** balloon – a first aerial ship “matriculated” with a Romanian name.

5. The next remarkable aeronautic events took place in Bucharest during the second half on 1889. Studies and aeronautics history works published in Romania do not mention the aeronautic ascents from Bucharest, 1889, which were made by Captain Edouard Spelterini – Swiss aeronaut and by the acrobat Leona Dare – of North-American origin. Leona Dare came from Moscow where she and the French aeronaut Leroux have been attacked, during a descent, by Russian fanatical peasants. After recovery, she will arrive to Bucharest, together with the Swiss aeronaut Edouard Spelterini, the first ascent taking place in the Cismigiu garden at October 8, in the presence of numerous people and officials. Under the nacelle there was suspended a trapeze where the girl gymnast was hanging in her teeth. Of a total amount of 7330 lei revenue, half was given to the Town Hall, for building a night pension. The second ascent took also place in Cismigiu garden, a journalist named Paul Haritin (Ciculescu) joining Spelterini and Dare. After that, the journalist will publish his impressions in a couple of newspapers. The third ascension, from Cismigiu, October 22, 1889, with Spelterini, Dare, Haritin and Captain Orezeanu. The evolution of the balloon and of the American gymnast has been seen by *whole Bucharest*, the streets being *crowded*. At the fourth ascent, the last from Cismigiu, in the nacelle there were Spelterini, Leona Dare, Alecu Popovici and for the second time, Captain Orezeanu.

Spelterini will receive a second larger balloon (1600 m³) – *for scientific ascents*. The first take off will take place from the Gas Factory of Filaret, at November 8, 1889, the balloon being conducted by Spelterini and having on-board the journalist Paul Haritin, Grigore Bălăceanu and the Lieutenant Văitoianu. The travel with the balloon will end near Turtucaia, after reaching an altitude of 3800 m and passing the Danube. After a night in the plain, they will leave from Turtucaia with the ship to Smarda (Giurgiu) and then with the train to Bucharest. The travel will be described by Paul Haritin, and after one year, Lt. Văitoianu will publish a description of the travel, attaching a map of the journey and a diagram of the heights.

6. In 1891, after 25 years on throne of King Carol I, there are organized popular shows in Cismigiu, including balloon ascents. Two impresarios (C. Bordan and Correni) hire for this purpose the Swedish aeronaut Paul Feller who had over 800 ascents in Sweden and England. His first ascent of June 16, 1891, with the Victoria balloon, launched from Cismigiu, has few spectators, the crowd preferring to see the show from the street. The balloon has landed after 45 minutes in Popești after a flight at 300-400 m altitude.

The second ascent of Captain Feller's balloon took place on June 23, 1891, from the garden of the Austro-Hungarian Casino from Bucharest. The balloon landed at the Sf. Vineri cemetery with no incidents. Both flights had only the Swedish aeronaut on-board.

There was again noticed that the public gas system had not enough flow to fill in a balloon within a reasonable amount of time. This was noticed on previous cases, and will be noticed to further ascents as well.

7. The name of Captain **Gheorghe Ferichide (1838-1925)** is mentioned several times in some Romanian works on the history of aeronautics, but with very short briefings and even with some inexact references to this flying machine. From the military archives, we have found the following about **Gheorghe Ferichide**: born: 14.10.1838 in Bucharest; sergeant: 21.08.1862; sub-lieutenant: 4.09.1865; lieutenant: 23.08.1869; captain: 1.01.1875. In 1890 he is retired, and at May 10, 1907 is Major under retreat. Died on November 19, 1925.

In 1881, with a notice addressed to King Carol I, the Minister of War I.C. Brătianu proposed to send Ferichide in France in order to study new researches related to dirigibles balloons, as this was the topic of a memoir Ferichide sent to Bratianu. We do not know any details related to his visit in France (took probably place in 1882), but during the first half of 1883, we find Ferichide's name in two articles published in the Bucharest newspaper of French language *L'Indépendance Roumaine*. Referring to the project of "*lenticular aerodine*" of Captain Ferichide, the *L'Aéronaute* journal of the French Aerial Navigation Society (whose member was Ferichide), publishes a series of information and comments, between May 10, 1883 and May 1884. There are memoirs, notes, articles and letters that are sent to the Society, which analyses them and propose them to plenary discussions, a scientific and technical dispute, at least honourable for Ferichide. It is very probable that, after his return to Romania, there were no funds available for his project. According to his own declarations from 1885, the project was presented to the Society on April 2, 1882 and that he obtained a patent for his project. We didn't manage to obtain this patent but we are sure that it could be found in the French archives.

As a consequence of his ideas and his active presence in the French aeronautical media, his project will be cited in popular works (de Graffigny, 1888: ... Capazza's metallical aerostat has...*a shape borrowed from another inventor, the Montenegrin [sic!] Captain Phérékyde...*; Lecornu, 1909: ...*project dating back in 1883 and presented by Captain Pherekyde of the Romanian Army...*; or Saint-Fégor, 1910: ... *in 1883 Romanian Captain presented a machine with a lenticular shape...*), **and this fact makes G. Ferichide to be the first Romanian with original aeronautical contributions who was presented in foreign works on the history of aeronautics.**

8. In some contemporary works on history of the Romanian aeronautics (1984, 1990 and 2003) there is mentioned the founding of the first unit of military aerostation which is said to be connected to the person of Lieutenant Eugeniu Assaky, who is mentioned to command this unit since 1893. We haven't found this name in the military archives, but we did find Lieutenant Eugeniu Asache, born in 1874, a cadet since 1894 and Lieutenant since 1900. The name change from **Asache to Asaki** and then to **Assaky** must have been caused by a scholarship within the Austro-Hungarian Army, in order to avoid the misspelling of the name. In 1904, after graduating the 2 year school in Wien, Lieutenant **Eugeniu Assaky (Asache – our note) comes back to Romania as the first Romanian Diplomat Aeronaut** (with a diploma). He presents his activity in public conferences, from which we learn that he made a total of 11 free ascents and 320 captive ascents, in different points of Europe. The highest altitude was 5964 m., while the largest distance traveled is Wien–Prielòpe (Bosnia) with a speed of more than 100 km per hour.

Assaky's conference together with Prince George Valentin Bibescu's initiative have as a result the founding in Bucharest of the Aero-Club, whose first major action was to buy a new spherical balloon, baptised „**ROMÂNIA**”. Made in Augsburg, Germany, under the supervision of Lieutenant Assaky, the balloon costed 18.000 francs (excluding the transport), had a capacity of 1500 m³, and a maximal diameter of 12 m. The nacelle for four persons had a reactangular shape with a side of 1.5 m and a weight of 175 kg.

The first ascent was programmed for October 19, 1905, from the Gas Factory in Filaret, but was postponed until the next day because of the low gas pressure. The ascent took place on **October 20, 1905**, at 10 a.m. There were four persons in the nacelle: Lieutenant Eugen Assaky, Lieutenant Paul D. Moruzzi, Marine Major Demetriad, and the prince Valentin G. Bibescu. There were a large number of spectators and oficialities. The maximal height was 960 m, they launched pigeons with messages and Bibescu made the first local aerial photos. They land after 80 km. and 5 hrs., in the Săpunari village, county of Ialomița, in the presence of more than 1000 peasants.

The second ascent took place on **October 30, 2005**, at 2 p.m., with the following: Valentin G. Bibescu, Lieutenant Assaky, Captain Gorsky, Niculescu-Ianca, flying over the Capital. The maximum height was **2500 m**, and the distance was approx. 40 km. The landing took place at 5.40 p.m., near Periș in a place named Polizoia. From our research, a first ascent in 1906 took place on **March 26**, 11.15 a.m. from Filaret, with the following on board: Captain Urlățeanu, Lieutenants Moruzzi and Assaky, and St. Theodoreanu. The balloon reached an altitude of 2200 m and landed near Zimnicea.

The next ascent was planned for Friday, **June 16, 1906**, 5.00 a.m., but is had to be postponed with approx. 2 hours because of low gas pressure. In the nacelle there were Lieutenant Assaky and Niculescu Ianca. Their intention was to make a two day flight, hoping to get to Bucovina or further. Lieutenant Assaky was conducting the balloon. By 1.45 a.m. they were over the mountains between Comarnic and Sinaia. On Saturday morning they were at a altitude of 3500 m., and at 12.00 they were flying between Cămpina and Ploiești towards Galați. At 4 p.m. they are at 600 m. altitude, back to Ploiești. They fly until Ghergani, then land in Potlogi, at a 4-5 km distance to railway station in Titu. The maximum altitude was **3100 m**, at 2.30 p.m., at a temperature of 15° C. The total flight duration was **32 hours**.

As regards the ascents from 1907, we found information about only one ascent, from June 15, connected to the *first Romanian Rallye-Auto*, a car contest in which the winner was the one who arrived first at the site where the balloon landed. The persons from the balloon were: Prince George Bibescu, President of the Aero-Club, Nicu Arion and Cantemir Câmpeanu. The balloon rised at 1600 m, towards Cotroceni, Ciorogârla, Bolintin and landed near Roșu village. The winner of the Rally was Jean Cămărășescu with a Darraq automobile of 16 CP, who got the first prize. Second prize was won by Maximilian Tonolla with De Dion of 30 CP.

We couldn't find additional details about the balloon and the Aero-Club, as prince Bibescu has put the automobiles at the forefront of the event. The aeronautic initiatives of Bibescu, Assaky and others have made aeronautics to become a them of general public interest.

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The second part of this Thesis: **A ROMANIAN IN THE DAWN OF AVIATION – TRAIAN VUIA (1872-1950)** is dedicated to the Romanian from Banat, who left for France in 1902 and became one of the most important pioneers of the powered flight, very well known with this VUIA monoplane and his priority flight of March 18, 1906.

He left for France, a true “pole” of the aeronautical activities at that time, with the need of more direct information, of an elevated scientific climate, of competent interlocutors and even competitors, and not the last, of a relevant industrial and technological support.

His starting conviction was that the powered flight could be realized by combining into a coherent ensemble two great previous technical achievements:

- ◆ **the automobile**, initially emerged as tricycle and rapidly evolved as quadricycle and with a sound functional level at the beginning of 20th century and:
- ◆ **a lifting glider wing** so it was realized, demonstrated and confirmed on a engineless flying machine, by the hundreds of gliding flights done by Lilientahl and his emulous from the last decade of the 19th century.

The automobile – in fact his running wheel system – will allow to optimally solving the problem of take off and landing, assuring by the traction of the propeller the needed speed for obtaining on the wing the necessary lifting force for taking off and the flight itself.

A morphological analysis of the Vuia machines shows that he conceived and built his monoplane in **8 successive variants**, of which **two for studies** (1903, in a Memoir to the Academy of Sciences and in his patent 332.106) and **six main variants, which were physically built: Vuia 1(1905), Vuia 1(1906), Vuia 1-bis (1906), Vuia 1-ter (1907), Vuia 2 (1907) and Vuia 2-bis/or 3 (1908).**

From this analysis, without additional details and taking into consideration only the relevant features, a short inventory may underline the following realized, experimented aspects:

3 general layouts; 3 variants for the angle of incidence control; 3 variants of upper wire mounting brackets to improve the rigidity of folding wings; 2 types of engine with 3 different positions of the engine; 3 propeller types; 3 variants of CO₂ engine alimentation and 2 variants to position the liquefied CO₂ bottles; 2 types of wheel suspensions and 2 types of smooth pneumatic tyres.

With the first five physical variants of his monoplane, Vuia did between December 2005 and July 1907, more than **22 series-days of experiments, tests and flights**. In addition to his priority flight from March 18, 1906, the most convincing results were flights of up to 24 m long at an altitude of up to 5 m.

His first merit was to have insisted, demonstrated and convinced for a definitive consecration of the heavier-than-air flying machines: **take off and landing on pneumatic wheels; thick wall steel tubes framework** and most important: **monoplane with a single tractive propeller**, all three being important milestones which are confirmed by the history of aviation, the concept of monoplane becoming, for more than half a century, almost generalized.

Together with other pioneers of the modern aviation who have contributed with ideas, scientific solutions, practical results on construction, piloting and exploitation of flying machines, making use of his last financial resources and health, even life, Traian Vuia must not be forgotten. **His first take off from Montesson (near Paris), of March 18, 1906, that short flight, jump or take off, on a distance of 12m at 0.6 m altitude, but done only with the resources on board his machine, using wheels, without any auxiliary means, has been celebrated by UNESCO, in 2006.**

Finally, in addition to foreign comments referring to Vuia and his monoplane, we present some new facts and aspects related to his life and work, as:

- Memoir and project of Traian Vuia to the Academy of Sciences from Paris (16.02.1903);
- Traian Vuia's naturalization in France (29.11.1923);
- Vuia monoplane's wing profile;
- Location of the tests done by Vuia with his monoplane in December 1905.

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The third part is entitled: **ROMANIANS IN AERONAUTICS – AERONAUTICS IN ROMANIA : AN OPEN CHRONICLE OF THE BEGINNINGS**

As a result of extensive researches, this chronicle represents a first try to collect and further to evaluate facts and data regarding the ways in which information and ideas about the early period of aeronautics have emerged in our country. All these data and facts illustrate the gradual development, within the territory of today's Romania, of a true "aeronautic phenomenon" which manifests also some local contributions, more and more significant towards the end of 19th century and beginning of the 20th century.

We took into consideration all the ways and forms in which this aeronautic "phenomenon" has emerged and developed in Romania and the way in which Romanians from Romania and other territories have implied themselves in this phenomenon. We have

included also persons from the minorities who have contributed to the development of some aeronautic events within the historical and modern borders of Romania.

Within this context we have chosen as generic title for our research the following:
ROMANIANS IN AERONAUTICS – AERONAUTICS IN ROMANIA.

As time horizon, this collection of facts and data has concentrated on the beginning – the least known period of the Romanian aeronautics – that is from the first pertinent information until the beginning of 20th century, more concrete until the first powered flight of Traian Vuia. The presentation is chronological and was associated with a synthetic description of the content of the related information, our aim being also to underline how the speciality terms and notions have emerged. There are 168 unique articles and multiple articles, with more than 241 entries, and 261 bibliographical references and notes, all these comprised within 68 pages of this *OPEN CHRONICLE OF THE BEGININGS*. From a thematic point of view, all these present some important directions as follows:

- news and information about aeronautical flights and ascents from abroad and Romania, as well as aeronautical events where Romanians have been involved;
- presentation of the history, principles and technical evolution of the heavier-than-air flying machines;
- presentation of the endeavours to make possible the human flight and that of heavier-than-air flying machines;
- information about the emergence and developments of the aeronautical shows;
- development of the rocket techniques as propellants for fireworks;
- development of more practical applications of lighter than the air flying machines instead of simple entertainment applications;
- emergence of military applications of aeronautics;
- introduction of notions and information related to aeronautics in school manuals and the specialty literature; first books and studies on aeronautics;
- emergence of Romanian specialists, first inventors, researchers, aeronauts, passengers and finally designers, constructors and pilots;
- development of systematic aeronautical activities and of team works instead of sporadic activities and isolated individuals;

These thematic directions, the facts and data that are detailed, represent some of the distinctive features of the emergence and development of the aeronautical phenomenon in Romania, an essential chapter of a history of the Romanian aeronautics which has never been written before us.

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