

IF IT HAD NOT BEEN FOR VUIA, WE WOULD NOT HAVE FLOWN. THE FULFILMENT OF A DREAM

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Abstract Now at the anniversary of 110 years from his first flight, the article points out the wish of a Romanian engineer to fly, symbolically, to become a *flyer*. March 18, 1906 – Montesson stands for the date and place registered in human history as the first lift off an aircraft by its own means, situated on board. Traian Vuia’s creative genius led him also to other remarkable inventions, such as the forced circulation boiler. In the romantic literature, the term *flyer* is a personification of the longing for the man loved, of intense love for the beloved. The *flyer* is considered the symbol of unrequited love, a man who, in life, was rejected by a woman and who, after death, haunts women on earth, especially the one who refused him. Similarly, Vuia demonstrated that a dream initially declined, can come true and be scientifically proven. His love is directed only towards the Romanian nation, whom he served and to whom he gave all his knowledge and passion!

Keywords: flying under its own power, boiler, priorities, Banat, Traian Vuia

Motto: “I have never searched for glory, because I know glory often loses the man. I do not work for my personal glory, but for the glory of human genius. What does it matter who did these things, it is important that they exist.” Traian Vuia

1. Education

Traian Vuia was born on August 17, 1872, in the commune of Bujoru, Surduc village, at the time, Caraş-Severin county, today, Timiş county. His father, a priest, Simion Popescu, was from Vîrset and his mother, Ana Vuia, was from Lipova, being a relative of the teacher and educator Iuliu Vuia. He had two sisters: Elena (Nina) and Ghizela. The scientist bore his father’s name only for two years, 1881-1883, afterwards, the rest of his life, he bore his mother's name [1], [2].

Ghizela Manzur talked about that period of childhood: “Traian Vuia, the child, was working all day long at manufacturing light objects floating in the air, like kites and balloons. He used to do the

experiments alone, without calling others - and he loved solitude. The work was bold, tensed, up to self-neglect, he used to enclose himself in the room and work”. These words prove what is known about geniuses, that they show their qualities from childhood! According to the child psychology studies conducted, between the age of one and two, the child is a little scientist and needs to explore the world and its environment [3].

At the age of five, he used to go with his sisters to the Romanian confessional school, where, later, he attended two courses. In this robust environment in which he grew up receiving a simple, austere and intellectually sporadic education, it is where his early interests in the technical domain took shape. He learned reading

and writing at the school in Bujor, then, he attended the remaining courses at the elementary school in Făget.

From childhood, he began to show passion also for the knowledge of clock mechanisms. During holidays, together with other children, he used to make pinwheels out of wood and tin and fix them on vertical axis in trees in order to show viewers the wind intensity and direction. He also built a large camera, which was original as conception except for the lens, which was bought. The attraction for *everything that flies* and the desire to build flying objects were inducted to him by different events that marked him deeply, namely: (i) his teacher Antal Mahler built for his son Lajos an impressive kite, event accentuating his curiosity for successive building phases and the need to balance this first *flying machine*;(ii) later, the father of another colleague made another device, even more imposing, that two stout individuals barely managed to bridle [5-6].

According to records from that period, from the 2nd to the 7th grade, the child VUIA obtained excellent marks in all subjects. In the 8th grade, Traian Vuia was among the top four students who passed the maturity exam with an exceptional grade. From high school, Traian Vuia remembers a sad episode, when some students of Wallachian nationality were expelled from all the high schools belonging to the monarchy, on the grounds that they infringed the official interdiction to speak Romanian loudly, in public places. The young students received that sanction because they gathered privately to readout works belonging to classical Romanian authors.

He attended secondary school at the State High School in Lugoj, and, in 1892, he had his baccalaureate exam. George Lipovan is the author who devoted a book to Vuia and remained famous for saying that “Traian Vuia owed to the city of Lugoj everything except his work and talent” [12-13].



Figure 1. 1881- Traian Vuia together with his mother and sister
“In the village where I lived with my parents, I built a long series of kites. Later on, as a high school student in Lugoj, I also built several kites, which I used to test on the vast area surrounding the camp.” - own translation



Figure 2. Vuia together with his confreres, looking seriously towards the horizon of science



Figure 3. Traian Vuia's PhD thesis in Legal Sciences: *Militarism și industrialism, regimul de status și de contractus* [Militarism and Industrialism, State and Contract Regime – our translation], May 6, 1901

Figures 1-2 present photos shoot in the époque.

Throughout the period lived in Lugoj, he spent a lot of time with the family of a well-known lawyer and politician, Coriolan Brediceanu, who later offered him unconditional support in the project that changed human history.

He went to Budapest to continue his studies. In 1892, he attended the courses offered by the Mechanical Department from the Polytechnic School in Budapest.

But, he also matriculated at the Faculty of Law, where he obtained his PhD. in legal sciences, after defending his paper entitled *Militarism și industrialism, regimul de statu și de contractu* [Militarism and Industrialism, State and Contract Regime – our translation] (1901) (see Figure 3). Upon his request, the work was to be written in Latin and not in Hungarian.

Due to material difficulties, after a year, he abandoned his technical studies and transferred to the Faculty of Law, without compulsory attendance, which allowed him to work in order to earn a living.

During those years, the scholarship (stipend)

received from the Foundation Gojdu was a real support. The transfer from polytechnic studies to legal sciences gave him the opportunity to work as an intern in well-known jurists' offices, spending time in several law offices from Banat. Therefore, from 1895 to 1897, he worked as a writer in the office of the lawyer Coriolan Brediceanu, Lugoj; from 1898 to 1899, he worked as a writer for the lawyer Spătaru in Vrșac; in 1900, he came back to Coriolan Brediceanu's office in Lugoj as a secretary; from 1900 to 1902 he was an intern and lawyer in George Dobrin's office.

2. Fulfilling the dream of flying

As his great dream was to fly, he began to perform calculations for the design of a flying machine. On July 1, 1902, he arrived in Paris, bringing with him the design of an original "airplane-car", projected as a college student, and its related model constructed during the last 12 months. As Paris was considered at that time the world centre of aeronautics, the young Vuia hoped to manage to fulfill his dream of flying there. He submitted a report entitled "airplane-car project" to the French Academy of Sciences, in which he presented his invention. Although he was given an unfavorable answer, he still received a French patent in 1903, starting the airplane-car's construction right in the autumn of that year (Photos presented in Figures 4-5).

On February 16, 1903, he submitted a report on the "airplane-car" he designed to the Academy of Sciences in Paris, but his project was rejected by the French scientific forum because they considered its realization impossible since aircrafts heavier than air could not fly. Moreover, the machine designed by Vuia had several features that were not understood at first by his contemporaries: it had one propeller instead of two, requirement thought absolutely necessary, and the engine designed seemed unachievable with the technical means of the time. Despite these hindrances, advised by Coriolan Brediceanu, his friend from high school, Vuia patented his invention, obtaining the French patent no. 332.106 of May 15, 1903.



Figure 4. "I go far away, mom, to Paris, but, don't worry, mom, cause I'll come back home from there, either flying or at all." Traian Vuia – own translation



Figure 5. "I left on my own, without any help. The habitants of Lugoj helped me later, contributing to the building of the machine." Traian Vuia – own translation

With the support of his family, who contributed significantly with money, Traian Vuia began building his plane. Vuia was forced to equip his little monoplane (airplane Vuia 1), which he had started to build in France in 1903, with many innovations. Things progressed slowly due to the lack of money. Not affording to purchase an ultra light engine, Vuia resigned himself to invent an engine with compressed carbonic acid, which had the advantage of being simple and inexpensive. However, it could not be accomplished, serving only for demonstrations (its operating time lasted approximately three minutes). In 1905, the airplane was ready. It was a monoplane - almost all attempts at that time were made with biplane aircrafts, Louis Blériot (1872-1937) following Vuia's example, a year later -, it had foldable wings, the same as a fan, carried on a quadri-cycle with pneumatic wheels acting as take-off and landing gear. The entire structure was metallic, made from jointed steel tubes.

At the end of 1905, the plane was ready and was tested for the first time. During this test, the plane rolled along the ground for quite a long distance. This first test was followed by others, to which well-known specialists, such as G. Besançon and Victor Tatin, attended.

On February 5, 1906, Vuia took another test with his plane, but obtained no results due to bad weather. On March 6, a new unsuccessful attempt to lift the plane off the ground was made.

The plane was called the bat due to its shape and had 250 kg, a support area of 14 sqm and an engine of 20 hp. *The bat* flew on March 18, 1906. It accelerated for 50 meters, lifted 1 meter, flew 12 meters, after which the propellers stopped and the machine fell (Figure 6).



Figure 6. Vuia's machine, called *The bat*, flew for the first time on March 18, 1906, near Paris, and lifted 12 meters. Photography from the museum bearing its name in Montesson

The day of March 18, 1906, will stand for Traian Vuia's first air success, as well as the first flight in human history with a machine heavier than air, which lifted off the ground under its own power. Vuia's plane was made of a steel tubes frame, with bulged cloth wings, which gave it the appearance of a bat. The engine worked with carbon dioxide as fuel and the landing gear consisted of four wheels with tires. This first self-powered flight took place in France, in Montesson. Traian Vuia's plane started moving using its own engine, rolled along about 50 meters, then took off and flew 12 meters at a height of 1 meter. A strong crosswind prevented the machine from continuing to fly, but the premiere happened: the first mechanic flight in history took place.

It is therefore recognized that on March 18, 1906, in Montesson, the Romanian Traian VUIA carried out the first (in the world) take-off from the ground of an aircraft using its own means, situated on the machine's board. At the same time, Vuia also set the monoplane shape and the landing gear (see Photos from Figure 7).



Fig. 67. Traian Vuia's airplane on the day of the first flight, which proved that it could fly on its own power, situated on the machine's board.

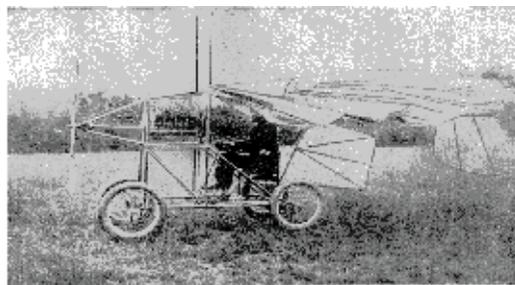


Fig. 67. Traian Vuia's airplane on the day of the first flight, which proved that it could fly on its own power, situated on the machine's board.

Figure 7. March 18, 1906 - Montesson, the first take-off in the world of an aircraft using its own means, situated on board

The premiere of such a flight is wrongly attributed to the French Santos-Dumont, who achieved the same, but only on September 13 of the same year 1906. Furthermore, after his first successful flight, the one on March 18, 1906, Traian Vuia carried out also other flights. During the one on August 19, 1906, his plane flew 20 meters, at a height of 2 meters and a half.

Vuia further improved his planes; the first used engine was replaced with another, of 24 hp, so that the machine Vuia no.1 became Vuia no. 1-bis, and then Vuia no. 2 [7-8].

On July 17, 1907, Traian Vuia managed to fly over a distance of 60 meters, but, at landing, he damaged the plane. By improving the first model, this became Vuia 1-bis. Later, a new airplane was built, equipped with an engine Antoinette on gasoline, with eight-cylinder V, water-cooled, of 25 hp, created by the engineer Léon Levavasseur. He flew with it in 1907, successfully remaining in the air for about 100 meters (Alberto Santos-Dumont already flew for 200 meters). This was called Vuia 2 and was patented in Belgium. Figure 8 presents stamps celebrating Traian Vuia and his planes.

Traian Vuia continued his research into the technical domain also after 1907. He organized a workshop-laboratory for the research of propellers, and together with Marcel Yvonneau devised some original models of helicopters (considered rotary wing machines), which were presented in public demonstrations (the models realized in 1918 and 1921). The magazines *La Technique Aeronautique* and *L'Atmosphere* published his theoretical studies (see Copies presented by Figure 9).

Among the results of the research conducted by Vuia, some confirmed later, the following ones

can be mentioned: he discovered the formula of monoplane aircrafts (subsequently recognized as the most appropriate), made the first airplane wing with variable incidence during flight, applied to his flying machine the principle of a single tractor propeller, made the first airplane with folding wings.

In the following years, Vuia continued to study aeronautics thoroughly, so that in 1918 and 1922, he made two types of helicopters, Vuia I and Vuia II. The machine was equipped with rotary wings, a rudder and a horizontal stabilizer (Vuia II had an Anzani engine of 16 hp). With these machines, Vuia conducted a series of tests and several vertical flights on the aerodromes from Juvisy and Issy-les-Moulineaux [9-10].



Figure 8. Series of stamps celebrating Traian Vuia and his planes



Figure 9. 1903 - French Academy of Sciences – Vuia’s study, accompanied by an invention project for his “airplane-car”.

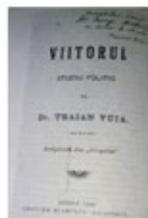


Figure 10. Study published by Vuia, in Lugoj

air’ can fly. (...) Now, after they are convinced of the possibility of mechanical flight, the number of tests will grow rapidly, specialists will realize special engines, aviation will have a flourishing industry based on my experience, which has become common property. You could see! I did not hide; I ran tests in front of everybody. *Others will continue, more and more.* This is how progress is made ... “ – Vuia wrote in a message sent to Professor Constantin Nedelcu, on his return from Paris in 1906 [9-10].

3. Vuia the fighter

The wide range of studied subjects allowed Vuia to practice as a lawyer, but also to publish his studies, among which the study *Viitorul* (see Figure 10) distinguished itself, which was published in the periodical *Drapelul* and printed in a separate booklet. By 1900, he made public his first political opinion saying “The solution to the national problem will be to unite Banat from Transylvania to its mother country.” C. Brediceanu gave a reply to this, which said “out of the mouth of these the future speaks.”

In the French capital, Traian Vuia continuously tried to influence the destiny of the Romanians in Transylvania, leading a real campaign for the unification with Romania. Thus, together with other Romanian leaders in Paris, on April 30, 1918, he founded the National Council of the Romanians in Transylvania. This new society used as a press channel the magazine *La Transylvania*, in which Vuia published numerous articles supporting the cause of those back home [6], [10].

Vuia was also a counselor in the Romanian delegation at the Paris Peace Conference (1919-1920) where, through the relationships he cultivated, made an important contribution to the unification of the Romanians. On this occasion, he published the paper *Le Banat* to make known the realities to co nationals here. In the same period, he published under a pseudonym a collection of articles appeared in Austro-Hungary, in which the other powers involved in the Peace Conference, i.e. Russia, France and Britain, were defamed. In this context, on his own initiative or following advice from home, he joined freemasonry, together with Alexandru Vaida-Voievod, it seems, to combat the Hungarian element powerfully present in this

Traian Vuia, like any visionary, encountered also various problems. By 1923, he intended to start the mass production of his flying machines and helicopter sat Reșița plants. The inventor gave the next message to a friend to deliver back home: “Tell friends back home everything you have seen here. I have proved that a machine ‘heavier than

organization, who acted by all means to prevent the union of the Romanian territories from the former Empire with Romania.

He was the chair of the National Council of the Romanians in Transylvania and Bukovina; he militated for the independence of Transylvania and its union with Romania, in Paris, in Île-de-France, France.

Always active, not only in aviation research, during the Second World War, in 1943, the Romanian engineer created the Romanian National Front in France. This organization acted in connection with the French resistance, which fought against the German occupation.

On Traian Vuia's initiative, on April 30, 1918, the National Council of the Romanians in Transylvania was founded at Paris, an organization militating for the unification of Ardeal/Transylvania/ with Romania. The council published also the magazine *La Transylvanie*, in which Traian Vuia wrote several articles. Vuia published articles on the same subject also in the magazine *La nation tchèque*. He was however very critical on the way in which the union of Ardeal with Transylvania was achieved, considering a big mistake the lack of negotiation regarding the union with the Kingdom of Romania. This would have defended the interests of the locals and would have permitted, in time, a westernization of Romania instead of a balkanization of Transylvania.

In the First World War, Traian Vuia worked for the French Ministry of Defense. Together with the well-known Victor Tatin, he built a torpedo used successfully by the Navy.

In April 8, 1922, in Garches (France), Vuia wrote to his mentor Caius Brediceanu:

“Dear Caius, I received your letter yesterday. I am aware of all that happened in the country. I followed closely the entire electoral campaign. What can I say? I cannot say I was surprised. I had the misfortune to know more closely the Phanariot spirit, not to say, virus. Having no illusion, I could not lose them. I was just surprised when I saw that you believed in a possible cooperation with them. My religion is made long ago.

Do not forget that even if our new masters have no illusion regarding our transformation into upstarts, they have historical evidence of the gentleness and resignation with which we wore so many yokes over so many centuries. They do not ignore our fear of violent resistance either. They

will let us cry and complain until we get tired, like the baby who cries. They admirably know our patience. They know how we have endured without any serious resistance the Hungarian yoke from 1867 onwards [52], not to mention the previous period. They also know that without the European war we would have endured the Hungarian yoke even today. When I read the newspapers from home, I have the impression that the events will take the same course. We can say as Eminescu: “Other masks, the same play” ... “

These are some sections from the thoughts tormenting Vuia.

He was so right! They are still so actual!

An episode that affected Vuia occurred in 1937, when he was invited to give a speech, during the International Exhibition of Aeronautics in the French capital. Because Dimitrie Gusti, the director of Romanian pavilion got sick, and the new director showed no interest for the idea, Vuia could not deliver his prepared speech. Disappointed by the way he was treated, he gave to an acquaintance a note with some written verses from Alfred de Vigny's *La mort du loup*: *Instead you'd fain your weighty task recall: To take, as I, that path that fate decrees, To live, to suffer, and die wordlessly.*

During the Second World War, Vuia was part of the resistance movement in France and was elected chair of the first legal council of the Romanian National Front in France, where he worked hard and published a series of articles in *La Roumanie Libre*. In 1950, Vuia returned in Romania, seriously ill.

4. Memento

Having as a landmark India many centuries before Christ, passing through the Old Testament to the ancient Greeks and the myth of Icarus and the Incas who call themselves the sons of the Sun, an unbowed dream has interlaced with the known history of mankind: the flight. *Memories of the future* about flying have been present in all cultures and civilizations all over the world since ancient times. The dream was to be turned into reality in the year of grace 1906. By a Romanian! Traian Vuia is the man who defied gravity without catapults or other external means and created the first machine heavier than air with which he achieved the self-propelled flight. Among the first Romanian inventors in the field, Traian Vuia (August 17, 1872 - September 2, 1950), has

received recognition for his work, even if for a long time the premiere in achieving the mechanical flight was attributed to the Brazilian (naturalized French) Alberto Santos-Dumont (1873-1932).

On May 27, 1946, he became an honorary member of the Romanian Academy. *“Stop praising me. Do not forget that all those who found out something in different areas of the ethnic progress, have no merit; God gave them the mind, they did not do it by themselves; we should be more modest. Boasting about what they did, they do as the Bible says, as the hammer that boasts about having made the stone. When a man discovers something, he should not have a reason for pride, but for humility. The Creator created the universe directly and created also the man, who, as an instrument made by him, executes all that we are aware and know in science, art, techniques. From our incompetence or forgetfulness of this truth, do come all sins. ... declared Traian Vuia.*

Eminescu distinguished between two worlds: the world of dreams and the world of thoughts, taken in antithesis. The world of dreams is *“lumea-nchipuirii cu-a ei visuri fericite”* [the world of illusion with its happy dreams - own translation], *“lumea-nchipuirii cu-a ei mândre flori de foc”* [the world of illusion with its proud flowers of fire - own translation]. The world of reality is *“lumea cea aieva, unde cu sudori muncite / Te încerci a scoate fapte din a stâncei coaste reci”* [the real world, where with worked sweat / You try to take facts from the rock’s cold rib - our translation], the world *“unde cerci viața s-o-notocmești, precum un faur / Cearc-a da fierului aspru forma cugetării reci”* [where you try to draw up life, like an ironsmith / Tries to give to the harsh iron the shape of a cold cogitation - own translation]. These verses can be interpreted and validated totally through all the work of Mr Vuia, crowning it in the mirror of history!

As in *Lucașfărul* [the Evening Star], the genius, Vuia, cannot descend to a middle level, the same as the ordinary man cannot reach a higher level.

That is why, dedicating to Vuia this modest evocation, now, at the celebration of 110 years from his first flight, we fulfill a pious duty towards the one who, set off from Banat to conquer the horizon, he succeed it!

The Banat falcon died on September 3, 1950, in Bucharest, writing his name on the list of

personalities who revolutionized modern society. Traian Vuia was a strong creative force, a forerunner spirit of his era, a pioneer of innovative roads in aviation and thermodynamics, as well as a great patriot, who, in difficult moments, served his country.

“Politicians are forgotten, renowned writers are forgotten, but we will not forget him ever. We will say proudly, **and we had VUIA**” - paraphrase after Nicolae Iorga, (in original referring to Aurel Vlaicu) [14].

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