

# 1970: Dialogue with Henri Coanda

## 1976: At the Space Museum in Washington

Anniversary Session “Celebrating 100 year of the first jet aircraft invented by Henri Coanda”,  
Romanian Academy, 15 December 2010, Bucharest, Romania

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DOI: 10.13111/2066-8201.2010.2.4.3

• Just a few days after his election as a member of the Romanian Academy on 16 December 1970, the scientist Henri Coanda accepted the invitation received from students at the Academy of Economic Studies (ASE) in Bucharest to give a lecture about water quality and its role in social and economic life, as well as about his inventions in the aviation field. The great man of science believed that the meetings with the students could not only rouse interest in his inventions, but also passion for their future work, regardless of profession, helping them to take a new departure of creative audacity to build a modern society facing an increasing process of development.

At the conference held at ASE I had the opportunity of meeting Henri Coanda. In the Amphitheater No. 1 of the prestigious higher education institution, the lecture hall filled to overflowing, the Romanian scientist, the absolute pioneer of the jet aircraft tried to discuss on the addressed themes on the constraining limit of his one-hour lecture.

At the end of the interesting presentation, but shy debate, I engaged in a dialogue, explaining to the distinguished personality that I was a physicist working in the field of informatics and cybernetics in search of a better understanding of the structure of water.

Henri Coanda told me that he was glad to find that I was a physicist and that he also loved physics. Furthermore, he confessed that he had met Albert Einstein and Nicola Tesla.

*“When I was in Geneva, I used to play with Einstein in a string quartet: he was playing the violin with virtuosity, while I was playing the cello. We sang with so much passion!”. Unfortunately, I can’t remember the names and professions of the other two members of the band. The scientist went on: “I was forced to give up playing the cello after the accident occurred in December 1910 when, at Issy les Moulineaux, while experiencing the turbo-propeller, I fell from about 10 meters, I think, and I broke my left arm. During the disastrous crash, a fire broke out and in a fraction of a second the flames spread to the fuselage and, therefore, also towards me, and burned my left cheek. I still have the scar left by that fire”.*

*“I had good relations with Tesla. We'd changed many ideas, we'd expressed our views. He had very interesting concerns and of a great practical application. Do you know what was his father's name ? asked me the scientist. **Teslea** after the name of the carpenters and wood-cutters' tool, the adze, called tesla in Romanian. Priest Tesla, the great inventor's father was Romanian, or Vlach, and according to the accounts of Nicola Tesla, he spoke Romanian with a strong accent specific to Banat, linguistic feature inherited from his families who had emigrated in Croatia from the Serbian Banat. Instead, neither Nicola Tesla nor his mother who was Serbian established **in Croatia couldn't speak Romanian at all**”.*

In our dialogue we approached some aspects of the “Coanda effect”, little known at that time in the country. I was interested in knowing how the Newtonian equations of fluid flow interacting with nearby profile mass and its form were generated.

He answered that the above-mentioned aspect had concerned him enormously and that he had assigned a lot of studies to that issue; I had the curiosity to ask him to elucidate whether a theory could be developed to optimize the aerodynamic profile as compared with the parameters resulting from the interaction of the fluid with the rigid profile.

Since there was no time to clarify the raised issues, Henri Coanda assured me that he had approached that interdependence, but that he didn't know to what extent the idea of profile optimizing could lead from a theoretical equation to the achievement of some appropriate profiles which, however, needed to be tested.

The last issue of interest for me was the dialogue with the scientist on the relationship between the water structure and the feeling of nostalgia.

I would like to mention that answering the question asked by a student about why the scientist had returned to his native country for the rest of life, Coanda said: *“because of water”*. *“Because water is of great importance – went on the scientist - in the emergence of nostalgia that generates fundamental decisions, such as returning home”*.

I advanced then the opinion that the crystals of snow about which he had interesting highlights during his exposure could be analyzed, not merely in terms of microclimate (ie, the thermodynamic parameters: pressure, absolute temperature and volume, namely concentration of water per volume of air unit), but especially in terms of average energy of connecting hydrogen bridges of associated water molecules and which fluctuates around 40 kcal/mol.

Also, as a physician, I was interested in knowing, if he had approached the molecular orbital calculation, in the study of water.

Academician Henri Coanda encouraged me by saying that my questions were of interest; He also said that the body tissues intracellular mechanisms resulting in psychosomatic behavior called nostalgia needed to be studied at the quantum level of components inside the cell.

At this level there is interaction between water molecules, nucleic acids (ribo and dezoxiribo) and cellular metabolites, interaction to be seen, from both biochemical and physical point of view of the molecular orbitals.

The scientist explained the following: *“each cell of the body is a biological clock (circadian biological clock) that at the scale of the human body, by summation, causes a certain behavior, and this - be it nostalgia phenomenon -manifestes itself according to the water structure. At the place of birth and childhood, in early years, the child consumes water from a specific structure. At the body cells level this will configure a certain biorhythm which is dictated by his biological clock stored at the brain level which is the psyche generator and controller. Changing the place of living means biological adaptation! After a number of years, usually in old age, metabolic requirements impose the consumption of the water originating in childhood, which has configured the body's biorhythm and claims its rights ”ab initio“ causing the psychological behavior called nostalgia”*.

Stressing that *“that is why I returned home”*, the great scholar shook my hand, expressing his joy to talk about water and not only with a physician.

- **The National Air and Space Museum of the Smithsonian Institution, The Space Museum** briefly (in Washington DC) was inaugurated on July 4, 1976, during the bicentennial of the Independence of the United States of America.

As a scholarship of the Ford Foundation Management Education Exchange Program, IREX, I was then at the New York University, studying in the field of Computer Science and Management Games, following an examination which I took with teachers from Carnegie - Mellon University in Pittsburgh.

The trip to Washington a week before the bicentennial event offered me the opportunity to visit the space museum which was in the final phase of detailed arrangement.

As it was possible to visit the museum before its inauguration, and, in addition, being free entry, I lingered a long time looking for the exhibits representing the Romanian contribution to the fields related to aviation, rockets, celestial mechanics and general study of the outer-space.

I found the following names of personalities originating in Romania: **Traian Vuia** (first model aircraft equipped with its own board), **Spiru Haret** (the astronomer's name given to a crater on the moon), **Herman Oberth** (inventor of the first long-range action ballistic missile) and the name of **George de Botezatu** (engineer and mathematician who established the equation of motion of a spacecraft leaving Earth, passing the invisible moon and return to Earth, the equation used without adjustment in the space program "Apollo").

In search of other compatriots I didn't find the name of Aurel Vlaicu and Henri Coanda, which is why I asked for an audience to the museum staff.

**Michael Collins**, the astronaut of the *Apollo 11* crew (16-24 July 1969) was the museum director at that time. He was the pilot of the command module and never left the lunar orbit awaiting the return of the lunar module with the two astronauts: Neil Armstrong (airship commander) and Edwin Aldrin (module pilot).

Showing great solicitude about my proposal of indicating the two pioneers of world aviation - Aurel Vlaicu and Henri Coanda - Michael Collins gave me a sheet of paper to write the correct name of the omitted personalities and some additional elements needed to identify the two Romanian.

With respect to Henri Coanda I mentioned the date and place of the first jet experiment (December 1910, Issy les Moulineaux, Paris), jet which he exhibited publicly in October 1910 at the Second International Aeronautic Salon in Paris, along with other information (Bristol, UK, etc.).

I also drew in a good approximation, the turboprop aircraft. Michael Collins expressed his gratitude for the information provided and assured me that the names and achievements of the two personalities would be properly highlighted in the museum, once the data provided confirmed in the documentary sources and research regarding the history of world aviation /space exploration.

The following year, 1977, after our returning home, Arsenescu Adina, an apartment neighbor, daughter of the interwar liberal minister, Victor Iamandi and a former employee of the Romanian Academy, undertook a trip to the USA, honoring an invitation to Washington. She promised to contact the Space Museum's administration to check the inclusion of our proposals advanced a year ago, related to Coanda and Vlaicu. Unfortunately, at that time

only the name of Henri Coanda, was mentioned in the museum and the poster of his turboprop figured among the exhibits. Aurel Vlaicu was omitted and we can talk only today about his recognition, by identifying him on the site of the Space Museum belonging to the Smithsonian Institution in Washington.

- On 16 September 1999 the issue no. 2886 of the newspaper “*ADEVARUL*”, published on page 15 the article entitled “*The Romanian Aviation Museum recovered the plans of the Top Secret U.S. Air Force lenticular aerodyne designed by Henri Coanda*“. The article talked about the “*flight divine vocation*” of the Romanian people and mentioned the collections of documents already existing in the museum archive or just desired, such as the collection of “*Aurel Vlaicu*” owned by the inventor's family whose archive could not be purchased for financial reasons. “*However the most valuable piece of the museum - the author assured us - is a recent acquisition. 80 packages with 600 pounds of documents, representing the great Romanian scientist Henri Coanda's archive*”.

In April 1960 H. Coanda received the UNESCO award, the “Scientific Research Merit with the rank of Commander”, and in 1961 The French government awarded him with the “Military Medal”. The United States granted honors, distinctions and diplomas which designated him as the “father of reactive aviation”. In 1971, he received an “honorary Fellowship of the Royal Aeronautical Society” in Great Britain. Alexandru Danielopolu, a former vice president of Air Club de France set his bronze effigy on the Parisian building where the pioneering scientist of the reactive aviation Coanda lived, and during 1970 to 1980 enthusiastically published his articles in the specialized French press (for example in *L'Aerophile* etc.) praising the great scholar's undeniable priorities in the field.

Coanda remains in the history of scientific discoveries as the first to recognize the practical application in aircraft development of the phenomenon named after his name, the Coanda effect which is the tendency of a fluid jet to be attracted to a nearby surface. Other inventions are to be noted: The Coanda-1910, an experimental aircraft constructed for air-reactive propulsion, an aircraft powered by two engines driving a single propeller- the configuration cancelled the torque of the engines. He invented a new decorative material for use in construction, so-called *beton-bois*; one prominent example of its use is the Palace of Culture, in Iași. In 1926 as he was working in Romania, Coanda developed a device to detect liquids under ground, useful in petroleum prospecting. Shortly thereafter, in the Persian Gulf region, he designed a system for offshore oil drilling. A modular system of sea water desalination and transformation to fresh water, based on solar energy, a clean, ecological and adaptable system represents another invention of this prestigious Romanian personality. By his contributions to this crucial domain that is aviation, Coanda remains one of the most important pioneers of the modern technological advancement worldwide.

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