Statement of Angela Agostiano, EuChemS president

EuChemS, the European Chemical Society, is a supranational association representing more than 130,000 chemists belonging to 50 societies and other chemistry-related organizations in 34 European countries. Our mission is to promote scientific discussion, the role and image of Chemistry and related sciences among policymakers and the public, and to speak with a single, unbiased European voice on key policy issues in Chemistry.In order to recognize merit in the advancement of Chemistry, we have well-established awards for individuals, and, more recently, we have launched the EuChemS Historical Landmarks Award Programme. The EuChemS Historical Landmark Award highlights and celebrates significant contributions to the field of Chemistry, showcasing breakthroughs that have shaped our understanding of the world and improved our lives. By recognizing these achievements, we acknowledge the importance of Chemistry in European history and cultural heritage, grant exposure to the geographical scope and the diversity of the European scientific landscape, and promotes it within the chemical community and beyond. By exploring the recipients and their groundbreaking discoveries, the progression of scientific knowledge and the impact of chemistry on society throughout history can be highlighted, helping us to appreciate the importance of scientific inquiry and innovation in shaping the world we live in today.

Map of the EuChemS Historical Landmarks

Map of the Catalan Countries

The EuChemS Historical Landmark Award can contribute to a sense of belonging to Europe by highlighting the continent's rich scientific heritage and the significant contributions of European chemists to the global scientific community. By celebrating these achievements, the award reinforces the idea of Europe as a hub of scientific innovation and excellence, fostering pride and connection among European scientists and citizens. It also promotes a sense of shared identity and unity within the European scientific community, contributing to the broader cultural and societal fabric of Europe. Altafulla, a town in the province of Tarragona on the southern coast of Catalonia, Spain, holds significant importance in the chemical heritage due to its connection to Antoni de Martí i Franquès, an influential chemist from the 18th century. Martí i Franquès is renowned for his accurate measurement of the composition of air, particularly for determining the exact proportion of nitrogen in the atmosphere. His work laid important groundwork for the study of gases and advanced the field of chemistry. The recognition by EuChemS of the old "Hospital de Pelegrins" (Hospital of Pilgrims) located in Altafulla, with the historical landmark at regional level, highlights the impact of Martí i Franquès' contributions to chemistry. By commemorating his achievements and the location where he conducted his work, EuChemS emphasizes the enduring importance of historical scientific endeavors and their relevance to contemporary scientific advancements.

Ceremony of the unveiling of the plaque

In recognition of the historical importance of a chemical procedure that was developed in the 18th century by Antoni de Martí i Franquès to determine the composition of atmospheric air, the Hospital of Pilgrims has been honoured with the EuChemS Historical Landmarks Award at the regional level.

Altafulla, 14th September 2024

Programme

Venue: Town Hall of Altafulla, Coord.: 41º 08' 34" N, 1º 22' 37" E

11:00 Welcoming ceremony and presentation of the event

Alba Muntadas, co-mayoress of Altafulla
Floris Rutjes, vicepresident of the EuChemS
Brigitte Van Tiggelen, chair of the EuChemS Historical Landmark Award Committee
Gregori Ujaque president of the SCQ
Àngel Messeguer, general secretary of the IEC
Consol Blanch, member of the *Historical Landmarks* commission of the SCQ

11:40 Historical note: *Antoni de Martí i Franquès. From the goodness to the composition of air* by Pere Grapí (SCQ).

12:00 Closing words of the co-mayoress of Altafulla and a break

12:15 Unveiling of the historical plaque at the Hospital of Pilgrims, Pl. del Pou, 14

12:30 Dramatization of texts on the life of Antoni de Martí i Franquès
Place: Esplanade next to the church of Sant Martí

13:15 Closing ceremony

Ajuntament d'Altafulla · EuChemS European Chemical Society · SCQ Societat Catalana de Química · Institut d'Estudis Catalans

EuChemS Historical Landmark Award 2022
at the regional level

Hospital of Pilgrims

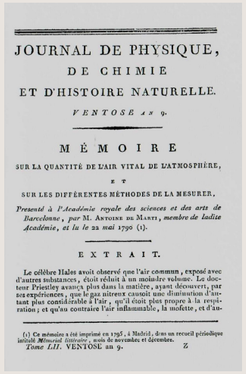
Antoni de Martí i Franquès

A Catalan chemist and naturalist of the 18th century

Altafulla, Catalonia

Antoni de Martí i Franquès

Portrait of Antoni de Martí i Franquès at The Royal Academy of Sciences and Arts of Barcelona. (Public domain)



JOURNAL DE PHYSIQUE,
DE CHIMIE
ET D'HISTOIRE NATURELLE.

VENTOSE an 9.

MÉMOIRE
SUR LA QUANTITÉ DE L'AIR VITAL DE L'ATMOSPHÈRE,
ET
SUR LES DIFFÉRENTES MÉTHODES DE LA MESURER,

Presenté à l'Académie royale des sciences et des arts de Barcelonne, par M. ANTOINE DE MARTI, *membre de ladite Académie, et lu le* 22 *mai* 1790 (1).

EXTRAIT.

Le célèbre Hales avoit observé que l'air commun, exposé avec d'autres substances, étoit réduit à un moindre volume. Le docteur Priestley avança plus dans la matière, ayant découvert, par ses expériences, que le gaz nitreux exposé aux émanations d'un tant plus considérable à l'air, qu'il étoit plus propre à la respiration; et qu'au contraire l'air inflammable, la mofette, et d'au-

(1) Ce mémoire a été imprimé en 1795, à Madrid, dans un recueil périodique intitulé *Memorial literario*, mois de novembre et décembre.
Tome LII. VENTOSE an 9. Z

The *Journal de physique, de chimie et d'histoire naturelle* (1801) included an extract from the article by Antoni de Martí i Franquès, which he had presented in 1790 in the Royal Academy of Sciences and Arts of Barcelona, setting out his conclusions on the amount of oxygen in the atmospheric air.

Antoni de Martí i Franquès (1750–1832) was born in Altafulla - a town in the province of Tarragona on the southern coast of Catalonia - in a local family of land-owning nobles with industrial interests. He was basically self-taught, and besides studying Latin and philosophy, he also studied several European languages such as French, English, German, Greek and Italian. During his life he built up a remarkable library that included the most important contemporary European scientific publications. He also had an office in the Hospital of Pilgrims, where he carried out his experimental and research activities. He lived in his hometown until 1798, when he moved to the city of Tarragona (which is where he died in August 1832), but it was in Altafulla where he carried out much of his experimental work. However, he spent periods of time in Barcelona where he entered into contact with scientific institutions, and in 1786 he was elected as a member of the Reial Acadèmia de Ciències i Arts de Barcelona (The Royal Academy of Sciences and Arts of Barcelona).

Martí also spent much of his time studying diverse science subjects. On the one hand, he devoted considerable effort to acquiring knowledge about the natural environment, accumulating geological and botanical collections, and also about meteorology. On the other hand, he conducted exhaustive experimental work on the study of common air and the reproduction of plants, as well as on other topics such as plant physiology and spontaneous generation. Evidence exists of five papers read by Martí at academic institutions in Barcelona, two of which were devoted to the study of atmospheric air that Martí had begun in June 1786. The paper read in May 1790, «*Memoir on the Quantity of Vital Air in the Atmosphere, and the Different Methods of Measuring it*», was published in 1795 in the *Memorial literario, instructivo y curioso de la Corte de Madrid*, and had a significant impact abroad. Abridged translations of this paper into French, English and German were published respectively in the *Journal de physique, de chimie et d'histoire naturelle* (1801), the *Philosophical Magazine* (1801) and the *Annalen der Physik* (1805).

The goodness of air

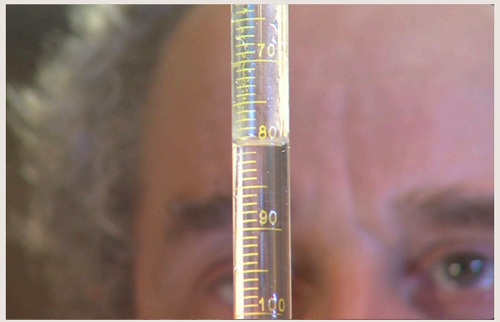
A cockatoo is placed in a glass jar attached to a vacuum pump. As the air is withdrawn the bird will suffocate. Detail from *Experiment on a Bird in the Air Pump*, 1768, by Joseph Wright of Derby, in the Tate Gallery, London. (Public Domain)

The interest in determining the goodness or breathability of air originated in a hygienist tradition that attributed to atmospheric air the capability of containing exhalations harmful to health. These poisonous exhalations presumably came from putrefying animal remains, rotting vegetation and stagnant water. Unhealthy environments produced harmful air, bad-smelling air, which then became putrid. This explained the spread of disease through the presence of unhealthy air that could harm living creatures in a weakened state. In this respect, small animals such as mice and birds became the usual first detectors of the breathability or not of any air.

The English natural philosopher Joseph Priestley (1733-1804) pointed out in 1772 that the use of mice in experiments to determine the quality of any particular kind of air caused a number of problems. For example, it was necessary to maintain a sufficient stock of mice. Priestley proposed an alternative: a test using nitrous air (nitrogen monoxide) to replace mice and birds to check the breathability of common air. In 1775, Marsilio Landriani (1751-1815), an Italian professor of experimental physics, designed an instrument based on Priestley's test to measure the salubrity of the air, which he called *eudiometer*. This term is derived from two Greek words and means 'the-measurement of good air'.

During the last decade of the eighteenth century, the nitrous air eudiometer had to defend its status against other new arrivals on the scene. As an experimental device, all eudiometers were based on the fact that the breathable part of atmospheric air could be extracted from an air sample by the action of a particular substance. These absorbent substances could be solid materials (phosphorous, iron filings with sulphur and potassium sulphide), aqueous solutions (of iron sulphate impregnated with nitrous gas and alkaline or calcium sulphides) or gaseous substances such as nitrous gas and hydrogen.

The eudiometrical test of Martí i Franquès



Modern replica of Martí's eudiometer by Antoni Quintana Marí. Courtesy of Marta and Antoni Quintana, heirs of Antoni Quintana Marí, the first scholar to study Marti's life and work. (Photos by the authors)

Martí was very well acquainted with the different eudiometrical tests known at the time. The subject of his paper read in May 1790 was the examination of the suitability and accuracy of these tests, with the intention of presenting his own device for the analysis of atmospheric air. Observations considered trustworthy by Martí appeared to have proved that atmospheric air contained between 20% and 30% of oxygen. Lavoisier (1743-1794) had found that oxygen represented roughly a quarter part of the atmospheric air. Martí was committed to narrowing that margin of uncertainty.

Martí decided to use a solution of calcium polysulphide (liquid calcareous liver of sulphur) impregnated with nitrogen as the best means to ascertain the quantity of oxygen contained in any gaseous mixture. Calcium polysulphide made the test quicker and the impregnation of nitrogen made it more accurate.

Martí stated that he had repeated this test so many times and that the uniformity of the results obtained clearly demonstrated the accuracy of his eudiometer. His firm conclusion was that in all seasons, in every month and at all hours, the air taken in the open fields of his country was always composed of between 21 and 22 parts of oxygen, and between 78 and 79 parts of nitrogen. He reported that he had collected samples of air in places where many people were present (including a theatre in Barcelona), and near ponds of stagnant water, and he always found these samples to be as pure as the common air. He was persuaded of the uselessness of eudiometers as instruments for attributing the accidental insalubrity of atmospheric air to its chemical composition. However, it must be recognized that eudiometers were indeed good instruments for measuring the chemical composition of atmospheric air.