

Speech delivered by Prof. Arthur Varela Cid at the  
opening ceremony of the I.C.A.S. Congress, Lisbon  
10 to 16 September 1978

Your Excellency, the Representative of the President of the Republic, General Ramalho Eanes, Commandant Isaias Gomes Teixeira and General Wilton Pereira representative of the Portuguese Air Force, Excellencies, Ladies and Gentlemen.

We should like to extend our greetings to His Excellency the Representative of the President of the Republic, and also to the representatives from the Portuguese Ministries who have helped in the preparation of this Congress, that we are opening at this moment.

We extend our greetings also to the Diplomatic representatives in Portugal, who have been of great help to the Portuguese nation.

We would also like to thank the delegates of the International Council of the Aeronautical Sciences, either of Portuguese or of other nationalities and would especially mention the Honorary President, Professor Maurice Roy, and the Executive President, John Green, whose kind words to the Portuguese Group of Aeronautics and to the Portuguese Nation are much appreciated. The remarkable efforts of Professor Dr. Ing. Rolf Staufenbiel, Executive Secretary of I.C.A.S. must be especially emphasized and thanked. We also thank all those who have worked with us or have been involved in any way, directly or indirectly.

We are very glad that you are taking part in this Congress, and would like to express our thanks for the help received in the preparation thereof from the Portuguese Government and private bodies. It is a great honour to our country that this Congress is being held in Portugal.

The contributions of the I.C.A.S. and I.A.F. Federation towards the solving of numerous problems in the scientific, technical, production and economic fields, deserve much gratitude: without their help it might not have been possible to find the solution to many of our problems.

Both I.C.A.S. and I.A.F. deal with similar matters, each in its own field, and each with a world-wide concern.



We shall also hear about the important aeronautical events that occurred in March and May 1927. The commemoration in the same year of these two events, with only two months between them, as well as that of the 75th anniversary of the Wright brother' flight is historically interesting.

We should like to recall the fact that the Brazilian, Lourenço Bartolomeu de Gusmão, of Portuguese origin, was the inventor of hot-air balloon flight, the forerunner of the aerostat.

On the 8th August, 1709, His Majesty King João V of Portugal and his court witnessed the experiment in the Royal Palace, "India House", in Lisbon. They saw an aerostat rise into space. This hot-air balloon was mentioned by the Papal Nuncio later in his memorandum which is today in the Vatican. "They saw an aerostat rising into space...."

This scientific event occurred two hundred and sixty eight years ago and was the subject of international chronicles of the time. Other experiments, also recorded, had St. George's Castle as their point of departure.



Fig. 2 - Monument to Bartolomeu de Gusmão in Santos, Brazil

Bartolomeu de Gusmão was born in Santos in Brazil, and in that town the Brazilian Government erected the monument illustrated here. On this monument there is an inscription stating that Bartolomeu de Gusmão was an inventor of the principle of the aerostat which made balloon flying possible.

We must not forget the contributions of many pioneer nations to aeronautical progress in this branch of engineering.

All Portuguese speaking territories Portugal, Brazil, Angola, Mozambique, Guiné, Azores, Madeira, Cabo Verde, Goa, Damão, Diu, Timor, Macau and others are grateful for the help given by France to the pioneering efforts of Santos Dumont, a Brazilian of French parentage. He was a Brazilian who lived in the Portuguese town of Oporto, the northern capital, where his relatives are still living.



Fig. 3 - Photograph of Santos Dumont, and the monument erected to him in Brazil.

In 1906, Santos Dumont took off in a XIV-bis flying machine, flew 220 metres and landed safely. It was the first European flight, three years after that of the Wright brothers.



Fig. 4 - Santos Dumont: his first mechanical flight

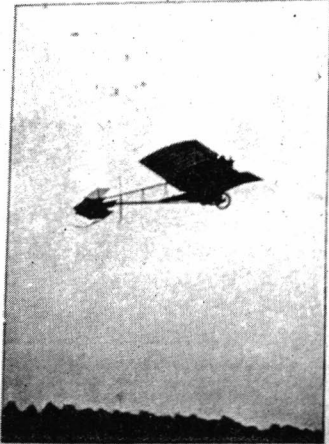
Santos Dumont was a close friend of Louis Blériot, the pioneer who crossed the Channel from France to Britain on the 25th July 1909.

Paris e est, le 6 décembre, à Antibes, l'aviateur Fernand qui fait une chute occasionnée par une avarie au gouvernail de profondeur.

Et comme ses victimes ne suffisaient pas encore à payer la rançon du 1<sup>er</sup> l'année 1910 eurent, des ses premiers jours, ensanglanté encore l'histoire de l'aviation avarement le 1<sup>er</sup> janvier De la grange, ce héros des premiers jours, tomba tour au champ d'honneur, en essayant un vol à grande vitesse sur un *Bleriot* avait changé le moteur chevaux en un moteur de vau, trop puissant pour la résistance de plane, et le 2 avril, même appareil, l'avia Blon vient se fracasser rochers en face de Saint-tien!

La liste funèbre s'est depuis, hélas! et près cents victimes étaient au martyrologe de l'aviation la fin de l'année 1910 d'autres encore, sans paieraient de leur vie le de l'aviation, mais il e même dans l'histoire nouvelle conquête de humain sur les forces de la nature: celle-ci se fois se révolter contre qui veut l'asservir et ne qu'à regret, après avoir tribut sanglant qui fait des inventeurs et des ins de véritables martyrs.

Mais leur mort est, survivants, un exemple et un enseignement, et les catastrophes du genre ne nous empêchent de nous avancer en avant de l'humanité.



12, Rue, Paris.

Fig. 382 - La Demoiselle de Santos-Dumont volant en pleine campagne.

Fig. 4A - Santos Dumont: the plane Demoiselle.

**CIENTISTAS DE VINTE E OITO PAISES ENALTECERAM O FEITO DE GAGO COUTINHO E SACADURA CABRAL E ENVIARAM MENSAGENS AOS PRESIDENTES**



A small block of text is visible at the bottom of the photograph, containing names and possibly a date, but it is too small to read clearly.

Fig. 5 - Gago Coutinho and Sacadura Cabral in their "Fairey" British aeroplane.

The system of celestial navigation for aircraft was introduced by Gago Coutinho and Sacadura Cabral in 1922, more precisely in June, during their famous flight from Lisbon to Rio de Janeiro.

After a general refitting in Lisbon with the help of the Portuguese Navy, the two took off from the Tagus for the flight from Lisbon to Rio de Janeiro on the 31st January, the Portuguese Admiral Gago Coutinho acting as navigator. This Portuguese gentleman had the honour to be the inventor of the sextant for air navigation.

On the 27th November 1930, the Dornier Do-X, piloted by Captain Merz, and in which Gago Coutinho later flew to Brazil, dropped anchor in the Tagus near the Tower of Belém, on its flight from England across Europe, via Bordeaux, to Lisbon to Rio de Janeiro.

The process of celestial navigation, for use in aircraft, was introduced by Gago Coutinho and Sacadura Cabral in 1922, in their famous flight from Lisbon to Rio de Janeiro.

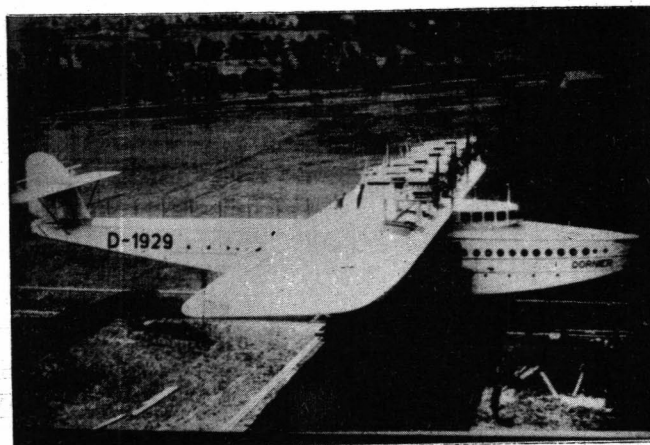


Fig. 6 - The Dornier Do-X in which Gago Coutinho acted as air navigator.

Later the Dornier flew from Rio de Janeiro to New York, following the coast; from there to Newfoundland and then back, via Portugal, to the place of the Dornier's origin - Lake Constance in Germany.

This co-operation forms part of the history of the Portuguese South Atlantic flights, and clearly shows the pioneering spirit that prevailed.

In his log book, Captain Merz noted that the advice given by Admiral Gago Coutinho on the subject of sextant navigation was of decisive help.

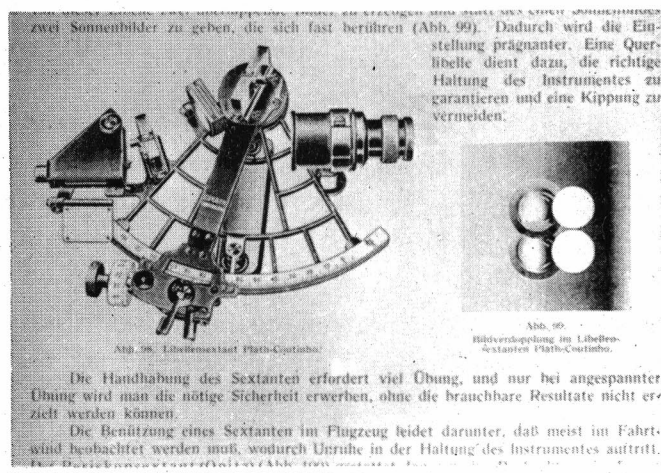


Fig. 7 - The Sextant invented by Gago Coutinho, already on the market, with some improvements.

Gago Coutinho's invention in this way played its part in aerial navigation. In the year 1977 the members of a Portuguese team: José Manuel Sarmiento de Beires, pilot, Jorge Castilho, navigator, and Manuel António Gouveia, mechanic, commemorated the 50th anniversary of their historical flight when they used celestial navigation.

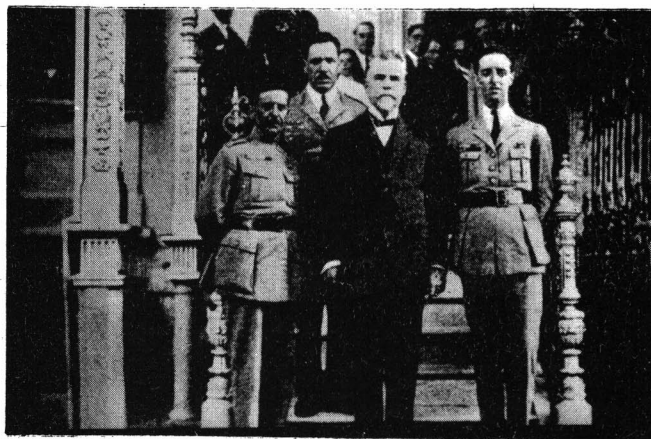


Fig. 8.- The President of Brazil, Doctor Washington Luís with Sarmiento de Beires, Jorge Castilho and Manuel Gouveia.

The hydroplane used by the Sarmento de Beires team was a Dornier Wal.

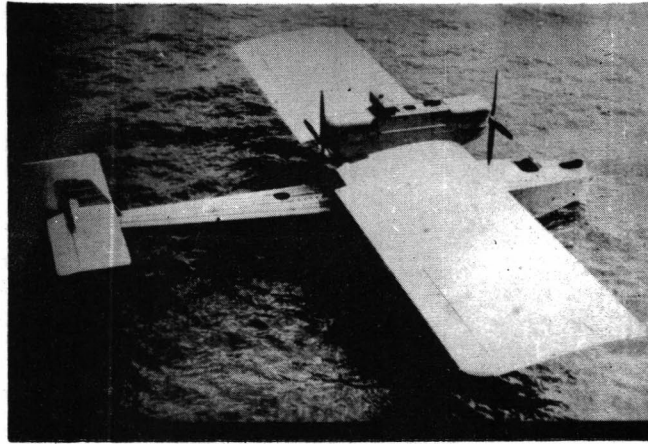


Fig. 9 - The Dornier Wal flown by the de Beires team.

One of the most remarkable events occurred on the 16th March 1927 during a dark evening flight from Bubabak. On this flight Fernando de Noronha established a world aeroplane record for distance and endurance, and showed the world the possibility of night flying with only sextant observations for reference.

Two months later a similar effort was made by Charles Augustus Lindbergh, on his marvellous flight from New York to Paris.

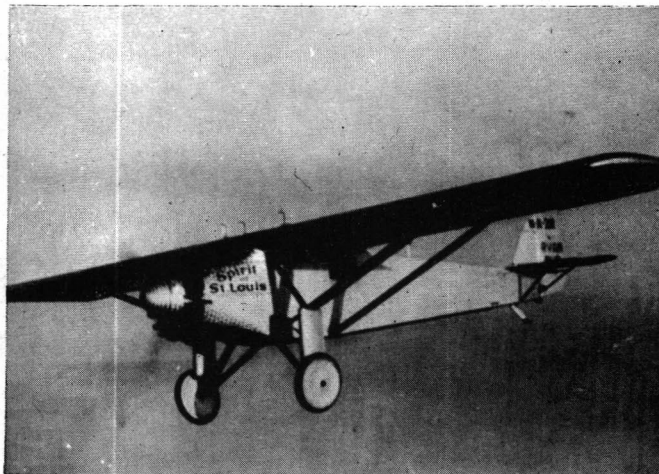


Fig. 10 - Charles Lindbergh's "Spirit of St. Louis".

On Sunday, 11th November 1933, Lindbergh and his young wife landed at Santander in Spain, their destination being the Portuguese Naval harbour in Lisbon.





Fig. 11 - Lindbergh's arrival at the Air Naval harbour in Lisbon.

The aeroplane was a Lockheed flying boat, a single engine, two-seater model Sirius, named Albatroz. Lindbergh's wife, Anne Spencer Morrow Lindbergh, pilot, was on that occasion a navigator and handled the radiocommunications.

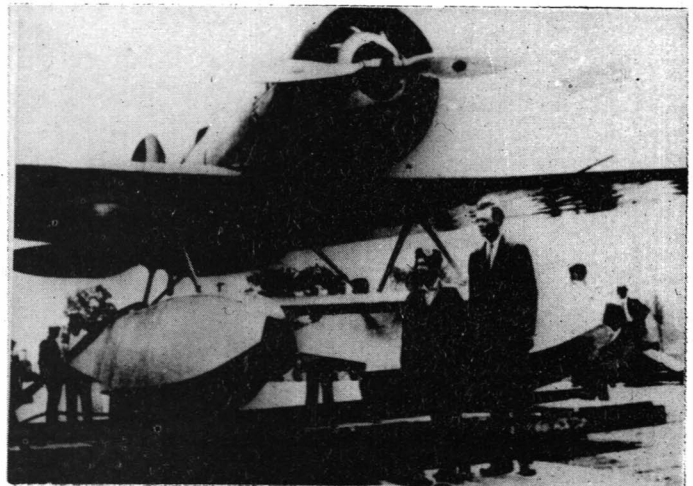


Fig. 12 - Lindbergh in Lisbon, with the model Sirius named Albatroz.

After this, the friendship between the Lindberghs and the Portuguese people increased greatly. For five months the couple collected information and flight conditions for navigation between Europe and the United States and Canada.

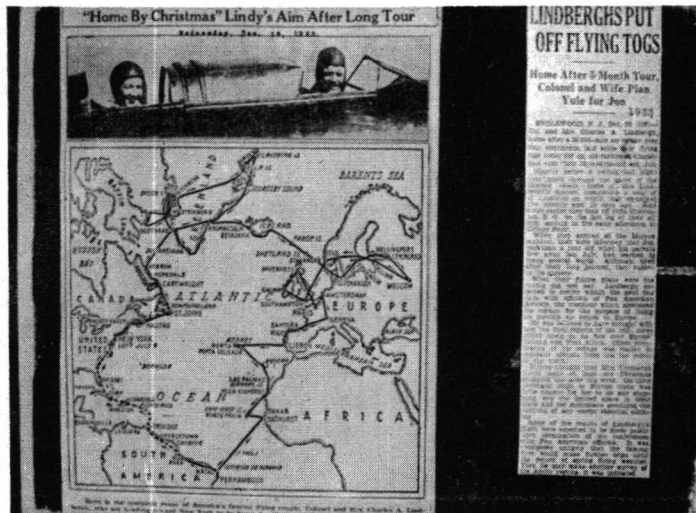


Fig. 13 - The Lindberghs, and a map showing the various routes they had flown.

During this time Lindbergh had several long meetings with Admiral Gago Coutinho, for whom he always showed a great liking and appreciation and from whom he obtained important information for celestial navigation.

After the first visit in 1933, the Portuguese Government put at his disposal the means for general repairs to his Lockheed flying boat, that was the assistance of the Portuguese Air Navy, and also, the radio tower at Monsanto for navigation and radio communication.

The Portuguese Government gave him sufficient help and the services of the Vessel "Gonçalo Zarco" from Lisbon to the Azores, and back. This ship was commanded by Captain António Cortez Carrasco, who was to give Lindbergh outstanding assistance in air navigation and telecommunications, and any help in air safety he might need.

In 1929, with the co-operation of the Air Navy and the Portuguese University of Lisbon, the author designed and built a sea-sailplane, given the name of "PORTUGAL".

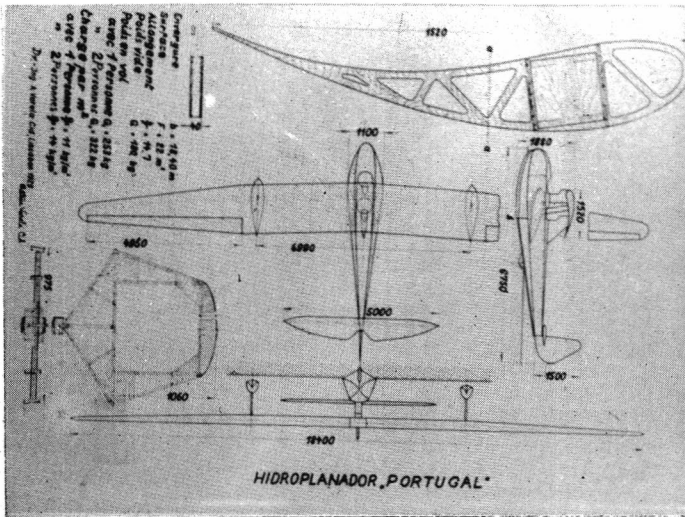


Fig. 14 - Hydroplane "Portugal"

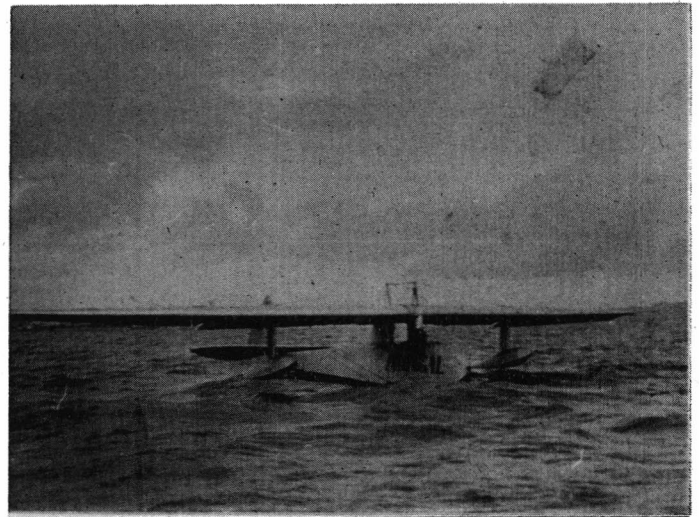


Fig. 15 - The Hydroplane "Portugal" on the Tagus.

The scientific aim of this sea-sailplane was the study of the ascending currents of maritime air, their origin, localization and the use that could be made of them for transatlantic air routes. The results were very impressive, and the recording instruments showed that the ascending currents were strong even when there was a difference of only one degree between the temperature of the water and that of the adjacent atmosphere. Since the density and specific heat of sea water are each about 1.0, the values for air are a good deal less. This is a very frequent phenomenon which, in those days, was interpreted only in mathematical terms. We are in an epoch in which such phenomena can have a broad application to transatlantic flights and with the assistance of electronic sensors and indicators could result in important fuel economies which would help in the present petroleum crisis. A judicious combination of the path of the aircraft, the ascending currents and horizontal winds in the same directions the flight will generate greater speed and therefore a good deal of fuel economy. For the maximum effect of this combination regions of less air turbulence must be chosen. Later, in 1936, the author who attended the University of Darmstadt and the Institute of Motorless Flight at Griesheim, co-operating with the extraordinary expertise of Professor Dr. Walter Georgii, Dr. Alexander Lippisch and Dipl. Ing. Hans Jacobs, who designed and constructed the first German hydroplane Seeadler which discovered the same phenomenon of the up and down motion of the currents of the air arising from the sea.

He was the official Pilot of the tests of the hydroplane Portugal, a sea-sailplane, at Lisbon in 1934, on the river Tagus, the Admiral Paulo Luizelo Teixeira Viana.

Portugal introduced, in the International Aeronautical Federation with Headquarters in Paris, a new category of aircraft, designated by "Hydroplaneur" (in French), with the unanimous approval of the Federation's Members from all Nations meeting in Paris.

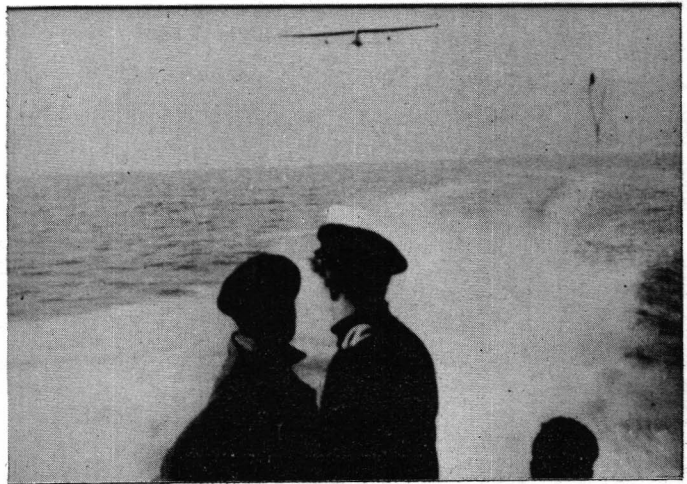


Fig. 16 - The hydroplane taking off



Fig. 17 - The hydroplane "Portugal" in flight

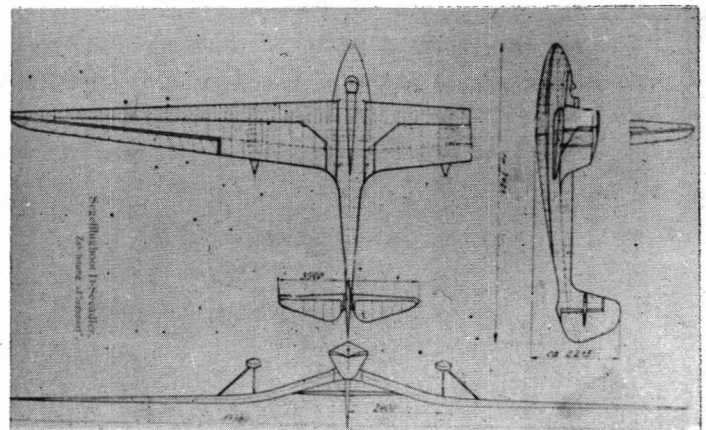
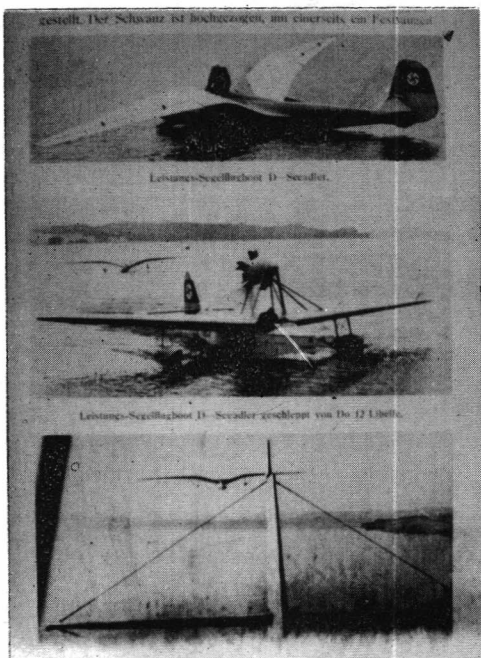


Fig. 17A - The German version of the hydroplane "Portugal".



◀ Fig. 17B - The German version of the flight tests which resulted perfect and also a proof of the maritime ascendant tide. Was piloted by Mrs. Hanna Reistch.

On the 22nd February 1937, there began discussions between the U.S. and the Portuguese Governments about landing rights in Portugal and the Azores for the establishment of an air line linking Lisbon and New York.

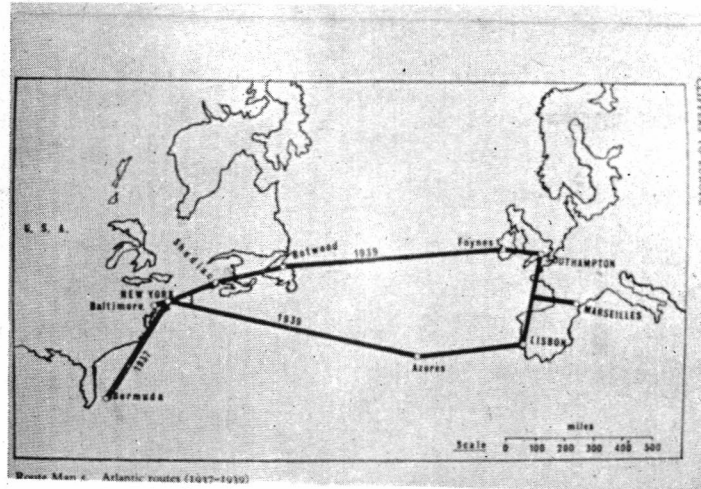


Fig. 18 - The route suggested by Lindbergh for North American/European flights.

This route, considered to be the safest, was very largely based on the research into transatlantic flight by Lindbergh, and his discussions with the United States and Portuguese Governments and Pan American Airways.



Fig. 19 - Cover of the "Pictorial History of Pan American Airways".

Its inauguration took place on the 29th June 1939, the first flight lasting 24 hours and 15 minutes. The first passenger to step off the flying boat was William L. Eck, born in Washington, who made a great deal of this in the press. The flying boat was a luxurious Boeing 314 called "Dixie Clipper".

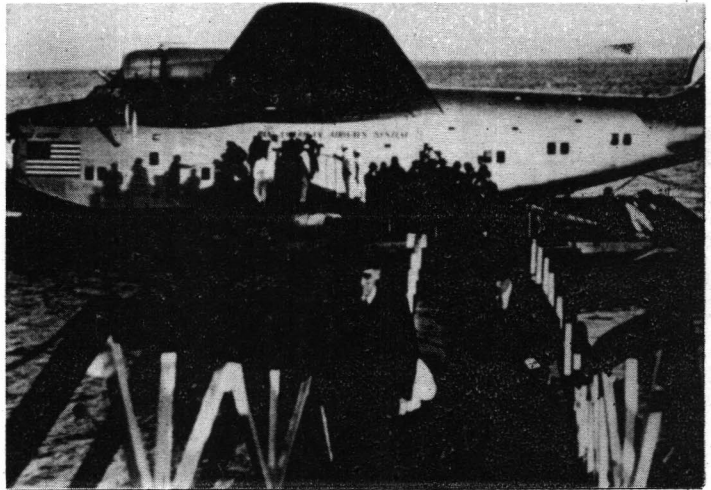


Fig. 20, 21 and 21A - Inaugural flight between New York/Lisbon and William L.Eck, (left) first passenger to land in Portugal.

This Boeing flying boat used the system of floating wings (sponsons) that is, it was based on the same theory as that of the Dornier Wal flown by Sarmiento de Beires.

It is of interest to mention here the world record made in September 1974 for the North Atlantic crossing: New York-Farnborough in 1 hour 55 minutes and 42 seconds. The Pilots were the USAF Majors James V. Sullivan and Noel F. Widdifield, aged 37 and 33 years wearing astronauts suits similar to those used by astronauts in their spacial flights from the earth to the moon. We were present at the landing and were witnesses of this historical record. Minutes later, President Ford of the U.S.A. telephoned to congratulate the two pilots on their success.

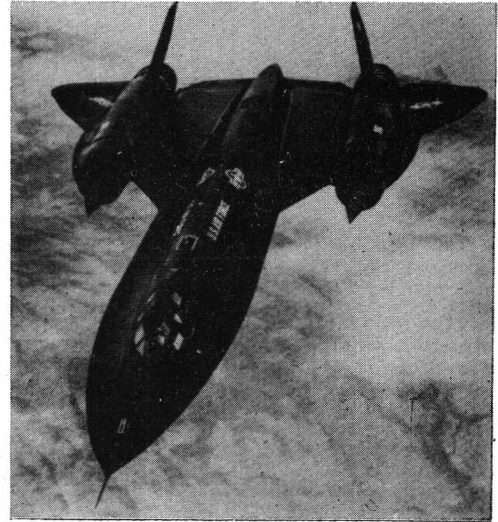
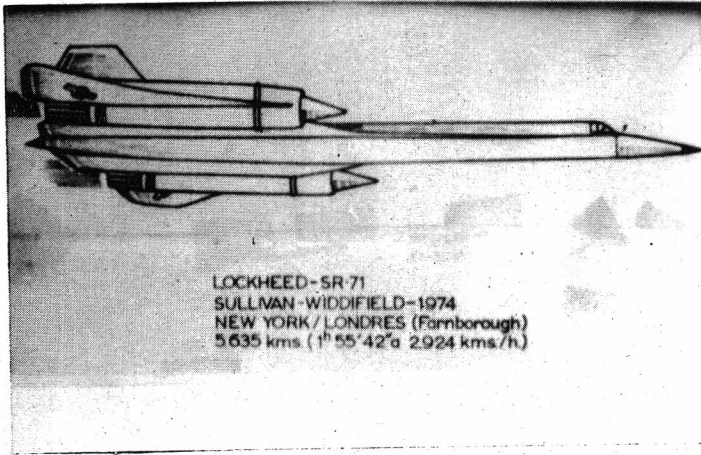


Fig. 22 - Record flight New York/Farnborough made by a Lockheed S.R.71

Refuelling was carried out in the air by aircraft especially conceived for this purpose, coming from the U.S. Air Force base at Lages in the Azores.

Lindbergh was a very attractive person, straight-forward and modest. He was greatly interested in the aeronautical problems being studied at that time. In Lindbergh, Pan American Airways found an invaluable adviser as regards the development and expansion of air transport for passengers, cargo and mail.

The President of Pan American Airways was Juan Trippe, a close friend of Lindbergh's, who joined him in some pioneering feats aimed at the expansion and advance of air transport.



Fig. 23 - Juan Trippe, President of Pan American Airways, with Lindbergh in Lisbon.

In Portugal, it was Eng. Pedro Ferreira Pinto Basto who in 1939 promoted the collaboration of Pan American Airways with our country.

Finally, I would like to point out that in this year, 1978, we commemorate the 130th anniversary of Otto Lilienthal's birth.

He is recognised as the founder of flight technique. He sacrificed himself for this cause and was killed in 1896 while gliding.

Lilienthal's writings have an important place in the history of the flight of birds on which he based his solution for the problem of flight equilibrium. After his death his writings were widely read in the five continents. It is to be noted that at that time certain articles were published in Portugal giving the result of these pioneering investigations.



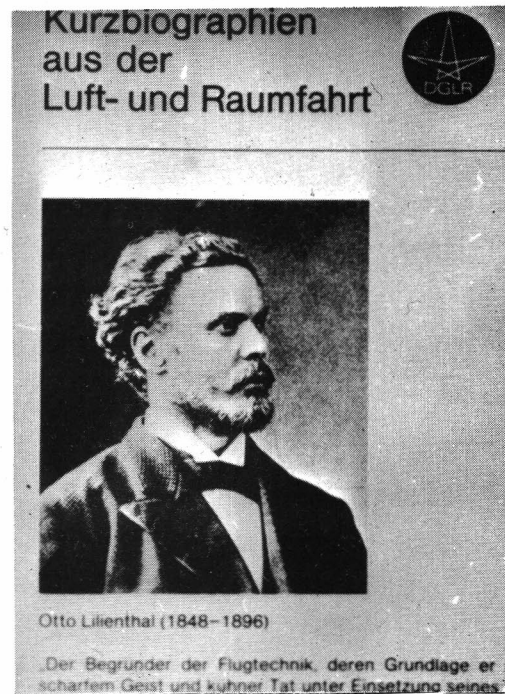


Fig. 24 - Otto Lilienthal.

Neither should we forget the famous pioneer of interplanetary flight, Werner von Braun, recently deceased.



Fig. 25 - Werner von Braun with the author.

He frequently visited Lisbon, when he was staying for a few weeks at Estoril with his wife Maria, and his children Margaret, Iris and Peter. The world is a poorer place because of his death.

Now Portugal would like to say thank you for all the scientific and technical co-operation so unselfishly given to us and which helped us to achieve these world record.

Our best wishes for the future of international co-operation and we are most grateful to you for your presence here among us.

NOTE: Mrs. Anne Lindbergh, who had been officially invited to attend the Congress, sent a telegram regretting that she was unable to accept and saying that she well remembered all the help they had received from Portugal in 1933. She sent her warmest greetings and thanks for the invitation, signing herself Anne Lindbergh.

Those taking part in the Congress all felt much honoured.

## LIST OF ILLUSTRATIONS

1. The Wright Brothers; the first flight.
2. Monument erected to Bartolomeu de Gusmão in Santos, Brazil.
3. Photograph of Santos Dumont, and the monument erected to him in Brazil.
4. Santos Dumont: his first mechanical flight.
5. Gago Coutinho and Sacadura Cabral in their "Fairey" British aeroplane in which they flew from Lisbon to Rio de Janeiro.
6. The Dornier Do-X in which Gago Coutinho acted as air navigator.
7. The Sextant invented by Gago Coutinho, already on the market.
8. The President of Brazil, Doctor Washington Luís, with Sarmento de Beires, Jorge Castilho and Manuel Gouveia.
9. The Dornier Wal flown by the Beires team.
10. Charles Lindbergh's "Spirit of St. Louis".
11. Lindbergh's arrival at the Air Naval harbour in Lisbon.
12. Lindbergh in Lisbon, with the "Sirius" named Albatroz, for investigation of an air route between North-America and Europe.
13. The Lindberghs and a map showing various routes they had flown.
14. The sea-sail Hydroplane named "PORTUGAL".
15. The Hydroplane "PORTUGAL" on the Tagus.
16. The Hydroplane taking off.
17. The Hydroplane "PORTUGAL" in flight, for the demonstration of static and dynamic stability.
- 17 A. The German version of the hydroplane "Portugal" built in 1936 two years after the official tests of the Portuguese original. It was named SEEADLER and was flown by the famous pilot Hanna Reitsch.
- 17 B. The German version in maritime tests flight.
18. The route suggested by Lindbergh for North American/European flights.
19. Cover of the "Pictorial History of Pan American Airways" impartial in the description of the facts. It reports that in 1933 Lindbergh and the American ambassador had negotiations with Portuguese Government that gave permission to land on water in Portugal and the Azores.
20. Inaugural flight between New York/Lisbon by Pan American Airways (newspaper cutting) as the first Scheduled connection between Europe and America, which existed for a long time without competition.
21. Pan American Airways "Dixie Clipper" and Mr. William Eck, left, first passenger to land in Portugal in a Scheduled flight.
22. Record flight New York. Farnborough made by Lockheed S.R. 71 made in one Hour fifty five minutes and forty two seconds.
23. Juan Trippe, President of Pan American Airways, with Lindbergh in Lisbon. They were close friends.
24. Otto Lilienthal who merits a special mention in this Congress because he was a pioneer and this year is the 130th anniversary of his birthday.
25. Werner von Braun with the author in Lisbon. They were fellows in the Darmstadt University in 1934.