

## Alberto Darias Principe

Universidad de La Laguna  
Facultad de Geografía e Historia  
E - 38207 La Laguna, Tenerife, Canarias

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## A Colonial Utopia

A Land Link Across the Gibraltar Straits

## Kolonijalna utopija

Kopnena veza preko Gibraltarskog tjesnaca

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### Abstract • Sažetak

The idea of a Gibraltar tunnel first appeared in the mid XIX century, with the first technical developments that led people to think, with excessive optimism, that the project was possible. It was not until several attempts had failed, that a military engineer appeared in the 30's with the conviction that a task of this magnitude was feasible. He cautiously took the first steps and initiated the necessary studies, and even made the first surveys. But, the Spanish Civil War and the Second World War interrupted what had been a promising start. When the idea was taken up again, it coincided with Moroccan independence and had to be discarded until very recently.

Ideja o Gibraltarskom tunelu prvi puta se pojavila sredinom XIX. stoljeća kada su počeci tehnološkog razvoja dali ljudima pretjerani optimizam pa su oni povjerovali da je to moguće. Tek kad je nekoliko pokušaja propalo, u tridesetim godinama dvadesetog stoljeća pojavio se jedan vojni inženjer uvjeren da je zadaću ove veličine moguće ostvariti. On je oprezno poduzeo prve korake i započeo potrebne studije, čak je izradio prva mjerenja. Ali Španjolski građanski rat, a zatim i Drugi svjetski rat, prekinuli su početak koji je mnogo obećavao. Kad su se ljudi ponovno počeli baviti tom zamisli, već je došlo vrijeme marokanske neovisnosti pa ju je do nedavno bilo potrebno odbaciti.

## 1. Introduction / Uvod

The ties between Europe and Africa over the Gibraltar Straits is a reality that goes back as far as man has inhabited this area, despite the difficulty of the straits. The stretch of water between two seas has never been an obstacle to establishing fluid relations between people, cultures and traditions of the two shores. Apart from certain segregationist aspects like the difference in mentality originated by different beliefs, the straits remain more of a link than a division.

## 2. The First Projects / Prvi projekti

Thus, when an optimistic spirit invaded society in the last century, thanks to the techniques that enabled man to face and overcome the barriers imposed by the physical world, one of the first projects that was tackled, however much of a utopia it may have appeared, was the idea of creating a land link between the two shores of the straits.

In 1860, French engineer Laurent de Villedemil won a Spanish government concession to build a tunnel under the straits. The project was supported by the Pereyra bank and used a newspaper entitled "The Gibraltar tunnel" as publicity. Unfortunately, the conditions at the time were not ideal for the project – political instability, civil war, the fall of Elizabeth II – so the capital that had been provided for the work was withdrawn and Villedemil went bankrupt. Some members of the military community – Generals Rubió, Sotomayor, Iba ez de Ibero – considered the possibility of continuing, but there was not a sound enough geological or oceanographic project on which to base the final plans<sup>1</sup>.

From then on, one plan rapidly followed another. Villedemil was followed by another Frenchman. Juan Bautista Berlier, an engineer who died in Deauville in 1911, presented another tunnel project at the turn of the century. Ever since he built the first underground line for electric trams<sup>2</sup> in Paris in the final years of the last century, he was obsessed by the idea of a grand subterranean gallery. He was to try to use the new techniques of electricity to overcome the problems that led to the failure of his predecessor in the challenge of building a tunnel under the Gibraltar straits.

In 1918, another Frenchman, Henry Bressler, presented another project to the French society of civil engineers, based on similar ideas to those of Berlier. There was nothing new in his project with regard to means for executing the work, because of a lack of knowledge of some of the fundamental aspects of the problem, as the data contained in the charts of the straits were insufficient, so another project was quickly forgotten.<sup>3</sup>

Spanish studies, although late arrivals, were more exhaustive. Engineer García Faria delivered a project for a railway link between the Algerian and Spanish networks to the negotiators at the Algeciras Conference. Moreover, this included a study of a tunnel link connecting the two continents. Later on, (1919), another engineer, Carlos Mendoza came up with a revolutionary solution consisting in a network of steel pipes that acted as a tunnel. The thickness of the pipes was to vary depending on the pressure they had to support. The pipes would rest on the sea bed and would be anchored to it. Mendoza considered a tube of ten to

<sup>1</sup> Anonymous: *El Túnel submarino bajo el estrecho de Gibraltar* In: "Revista Hispanoafriicana", June-July 1928, n. 6-7: 16.

<sup>2</sup> *Enciclopedia Universal Ilustrada Europea-Americana*. Appendix, Vol. II. Espasa Calpe – Madrid: 143.

<sup>3</sup> Jimenez, E., *El cruce del Estrecho de Gibraltar* in: "Ingeniería y Construcción", Madrid, July 1934. n. 139: 468.

twelve metres in diameter and 30 cm thick, to take a single torpedo-shaped carriage that, according to the engineer, "*would prevent local deformations*"<sup>4</sup>.

The first work to be taken into consideration, however, was the work of engineer and writer Mariano Rubio y Bellvé, a soldier born in Tarragona (Spain) in 1862. One of his last publications, published in 1920, was entitled "Comunicación a través del Estrecho de Gibraltar" (Communication via the Gibraltar Straits). He started writing it four years beforehand, so that, by 1918, he was able to apply for help from the Ministry of War, in the form of the technical data that were necessary for a conscientious study. He asked for five years for carrying out the design. Through more modern eyes, the work tended to be superficial, hardly surprising if we bear in mind the fact that basically, he was seeking permission for carrying out a detailed study. The project did not have a sound geological study but, on the other hand, it was the first time that a more feasible layout was sought, even if it was longer. Thus, two routes were considered:

- The narrowest part of the straits is approximately 14 km wide, but, according to the soundings taken, the depth reaches 600 metres, which would mean digging down to 650 meters at the deepest point of the tunnel, as this had to be well below the sea-bed. This meant that, if we accept a gradient of 25 millimetres per metre, the access gallery to the lowest point would have to be 26 km long on each side and the tunnel would have to be 58 km long.
- In the other route, under the Atlantic, an inter-continental link could be established without having to go below 300 metres, adopting 380 metres for the lowest stretch of the tunnel. Therefore, with the same gradient per metre, the stretch leading to the lowest point would measure 16 km and the total length of the tunnel would be 35 km.<sup>5</sup> Thus, for the first time, the decision was taken to adopt the Atlantic solution as the more feasible, rather than the shortest distance between the two shores.

What seemed to be a promising start, did not come to much. The work done in Barcelona for planning Montjuich mountain, where some of the buildings for the 1929 Universal Exposition were supposed to be sited, and the fact that he was involved in other studies, such as the curious paper on "The fifth dimension" presented at the Porto Congress of Sciences in 1920, and his article on "Human work", which appeared in Barcelona in 1924, meant that Mariano Rubio had to give up his tunnel project.

### 3. The Revival of the Idea / Obnova ideje

For some time, the idea of the tunnel seemed to have been forgotten, until the euphoria arising from the similar project of a Tunnel under the English Channel, breathed new life into the idea. Once again, a soldier would take charge, Lieutenant Colonel of Artillery Pedro Jevenois. But, in this case, the process was far more mature. The fact that it was only a hypothesis means that it has to be presented in several stages:

- To determine what experiences and research plans were necessary to draw up a final project for the tunnel.
- To obtain the necessary resources from the state and from private individuals and a concession for the State Inspectorate for an official or private body to draw up the final plans.

4 Jevenois, P., *El túnel submarino del Estrecho de Gibraltar*, "Estudio científico de sus posibilidades", Ed. Voluntad. Madrid s/f (1927): 45-58.

5 *Ibidem*: 42-45.

- Once the project had been conceived, to build the tunnel.
- Once the tunnel was built, found a company to operate it.

Under these conditions, when Jevenois finished the preliminary study, he obviously did not know exactly which solution to adopt. He, himself, wrote in 1927:

"In our opinion, the material impossibility of presenting a project for a tunnel under the Gibraltar Straits that is anything other than theoretical, has been demonstrated, because, without an exhaustive geological study, it is impossible even to decide on the exact starting point or the mouth of the tunnel".<sup>6</sup>

Data such as the permeability of the earth under the sea-bed or the resistance of the sub-soil, essential for carrying out the work, were unknown. That is why he added:

"It is obvious to us that it is impossible to know whether the undertaking is feasible or not, or whether it would be a better idea to use a floating pipe or a tunnel, without a costly geological and oceanographic study, which would require the use of excellent technical personnel and means that only the State possesses".<sup>7</sup>

But, if the tunnel were chosen, the expert did know some basic aspects:

- The gallery should be circular in shape in order to spread the pressure load evenly in all directions, and it should be lined with reinforced waterproof cement.
- As a reference for traffic and activity, one of the busiest lines in Spain was used, with a concentration of 40 trains (20 in each direction), with an annual increase in traffic being factored in. These figures are well below minimum traffic figures for today and are not in line with the expectations that had been established for connecting the three basic axes of the African rail network.
- Ventilation of the tunnel was projected with a large dose of ignorance and an equal amount of naivety. The basic premise was: "that the passage of the trains alone forms a current that renews the air, but should this prove to be insufficient, it would be advisable to call on artificial procedures".<sup>8</sup>

On this subject, one should not forget that the tunnel was planned to be 30 or 32 km long.

Up until 1926, the year in which Jevenois wrote a book on the possible feasibility of the tunnel, the idea was fairly vague. It could be said that it was limited to a series of conclusions based on the experiences of others; American tunnels, English, French and German tunnels and, above all, the models of the Simplon and Saint Gothard tunnels. This can be seen from the 18 points considered by the author as "conditions of the submarine tunnel" – that are based, in turn, on the nine premises of Charles Rolut, the builder of the Mendor tunnel – for building long tunnels under water and that he presented to the Paris Academy of Sciences in 1919.

Jevenois' conditions were as follows:

1. Linking the tunnel entrances in Africa and Europe with the general networks of Africa and Spain is a normal engineering problem.
2. The length of the submarine tunnel we are proposing is less than that of many mine galleries that have already been built, similar to the length of some subterranean conduits and viaducts, and only slightly longer than the great tunnels of the world.
3. Even taking into account the enormous depth of the narrowest part of the Straits, a 30 to 32 km tunnel can be dug that is suitable for the passage of all kinds of passenger and freight trains.
4. The possibility of using ramps and gradients of 2.5 to 5 thousandths enables all kinds of unfavourable biological layers that could appear to be tackled.

<sup>6</sup> *Ibidem*: 85.

<sup>7</sup> *Ibidem*: 116.

<sup>8</sup> *Ibidem*: 130.

5. If necessary, certain ground could be used for building artificial islands, meaning that new accesses could be opened, thus accelerating the construction of the tunnel.
6. Water leaks are unlikely; given the impermeability of the expected ocean terrain, they will probably be no greater than those overcome in the Simplon, a tunnel which passes under a lake and which came across a river.
7. With a single line and two crossings, a similar number of trains can cross the Straits, to those circulating on Spanish lines.
8. Ventilation of the tunnel is a problem that the art of modern engineering has overcome. It is not an obstacle to building the tunnel.
9. The temperature in the tunnel will be perfectly acceptable and if it were not, methods of refrigeration currently exist.
10. The progress in drilling machines makes it possible to advance in all kinds of terrain, as experience has shown.
11. There are rules for building tunnels under water, which make it possible to avoid accidents and disappointments, wherever humanly possible, that have been applied in many different cases.
12. The most appropriate lining for galleries submitted to strong pressure in all kinds of terrains, and the most appropriate diameters for them, have been studied.
13. The problem of draining the tunnel has been solved in galleries that are much longer and has been calculated and included in their plans, without resorting to artificial means.
14. Pumping the drainage wells (of less than 600 ms) is a normal engineering problem, as is the construction of these wells.
15. The profile the tunnel must adopt because of the necessities of drainage is no secret whatsoever.
16. Studies and plans have been made to work on several stretches of the tunnel simultaneously, and work on both mouths will only be started through an auxiliary evacuation gallery.
17. The slope that must be overcome in 15 km in the depth of the Straits is fairly similar to others that are overcome by existing railway lines.
18. There are electric machines that can pull ordinary trains up slopes of up to five millimetres per metre in double traction.<sup>9</sup>

Moreover, given the advanced state of the preparations for building the Channel Tunnel, drilling was expected to start on the Gibraltar tunnel immediately afterwards, in order to profit from the experience and even use the same material.

Jevenois was in agreement with Rubio y Bellvé when he rejected the shortest possible distance, as this would mean having to go too deep. Following the Channel Tunnel project, the author opted for a double gallery without a simultaneous layout, to be connected at periodic intervals. To avoid resistance between the two from the geological point of view, the communicating tunnels were to be 6 metres long, every 15 metres along the main tunnel. Concerning the railway line, which was the prime means of communication, although not the only one, it should be designed with the following features:

- A design of ramps and gradients to enable trains, both trains with Spanish gage and those using a normal gage, to cross the Strait without trans-shipment.
- Trains should not be broken up and it must be possible to travel at speeds of not less than 30 km/h, to reach a minimum traffic of 20 trains in each direction.
- The need to cross under the sea, dropping down 500 to 600 metres, in the centre of the Straits. The subterranean line would be 30 to 32 km long.

To guarantee the project, a series of prior requisites were also necessary:

- Draw up the geological map of the Gibraltar Straits and its shores to a distance of 10 km inland from the coast, in order to understand the tunnel's entrance and exit areas.

<sup>9</sup> *Ibidem*: 137-138.

- A geological diagram to a depth of 600 metres, of this area and the sea bottom.
- Draw an underwater chart of the Straits.
- Elaborate profiles of several cross sections with their corresponding geological diagrams.

Thus, the work presented by Jevenois in 1927 was really no more than an hypothesis based on the experience of others and merely theoretical. Even so, his book received an excellent welcome abroad. The Italians applauded the proposal, given their interest in their colonies of Tripoli and Cirenaica, which was not only confirmed by all the fascist press, but also by more specialised journals like "Antologia nuova", "Revista maritime", "L'Italia coloniale" and "Revista italiana de obras públicas".

The situation in France was very similar. Despite the disagreements that existed in the Bordeaux-Marseilles axis, the Academy of Sciences and the Geographic Society supported Jevenois' premises. The work aroused less interest in England and Germany, but it was in Latin America where news of the project was celebrated with the creation of tunnel committees.<sup>10</sup>

In December 1926, Jevenois approached the Ministry of State and the Director General for the Colonies, asking them to give their approval to the idea of building his tunnel; the possibility of creating a study committee aimed at drafting the plans; and with authority to collect all and any information existing in State offices to carry out the study on both shores of the Straits.

The government wanted to check the technical feasibility of the work from the point of view of public resources, thus it accepted the offer in all its terms, including personal co-operation with Jevenois, and they were willing to carry out the project at their expense<sup>11</sup>. From then on, general acceptance not only increased, it also accelerated, as can be seen from the a series of events<sup>12</sup>:

- 1<sup>st</sup> of September 1927: the book *El túnel submarino del Estrecho de Gibraltar* (The Gibraltar Straits submarine tunnel) was published.
- 15<sup>th</sup> of September 1927: The extended project and an application to for a Commission to deal with the matter were presented to the Ministry of Development.
- 30<sup>th</sup> of April 1928: after an agreement of the Council of Ministers, a commission was appointed to study and complete the plans.
- 27<sup>th</sup> June 1928: the African League cried out for the tunnel to be built.
- 17<sup>th</sup> July 1928: the Government took over the management and financing of the studies needed to check the feasibility of the tunnel.
- 5<sup>th</sup> December 1928: geological work is carried out in Andalucia and a site near Tarifa is chosen as a potential exit zone in Spain.
- 30<sup>th</sup> January 1929: credits are granted for the Mainland budget and work is ordered to continue.
- 22<sup>nd</sup> February 1929: credits are granted for the budget of the protectorate of Morocco.
- 1<sup>st</sup> April 1929: geological work is carried out in Africa.
- 20<sup>th</sup> April 1929: The international Mediterranean Commission recommends that Spain carry out an intensive study of the Gibraltar Straits, given the interest aroused by the project.

<sup>10</sup> Anonymous, *o.c.*: 17.

<sup>11</sup> *Ibidem*.

<sup>12</sup> Jevenois, P., *El túnel bajo el Estrecho y los intereses de Ceuta, "Africa"*, June 1929: 154.

#### 4. Political Factors in the Acceptance of Jevenois' Project / Politički faktori u prihvaćanju Jevenoisovog projekta

The draft plans for the Gibraltar tunnel could not have been drawn up at a better time. Spain, since it had lost its overseas colonies in 1898 (Cuba, Puerto Rico, the Filipines and the Pacific island chains) was going through one of the most pessimistic moments in its history. Regenerationist attempts and isolationist temptations distorted the country, generating a general feeling of failure. The failure of the policy of colonising the north of Morocco must be added to this, with Spain's inability to pacify the Rift region that was in the hands of rebels. All of this led to a general instability that took the shape of serious events like the Tragic Week of Barcelona, in which anarchists took advantage to wreak destruction in the city.

In 1923, General Primo de Rivera, with the acquiescence of King Alphonse XII, illegally took power, implanting a dictatorship that was to last until 1930. Fascism impregnated the new regime, which made a desperate effort to find a worth place among nations. In this climate, a project like the Gibraltar tunnel undoubtedly provided the prestige desired by the Nation, transforming Spain from being a country at the end of Europe into an compulsory passing place for an infinity of communications, thus becoming a key cog in the continent of Europe.

Because of all of this, the country's ability to take charge of a task of this dimension had to be demonstrated. Even years after the fall of the Dictatorship, the idea was kept alive and the tunnel was the subject of articles, such as:

"Patriotism inexcusably demands not giving way to discouragement in the face of the universal crisis of the present moment and, it also demands that we work with tenacious consistency until Spain occupies the place of the great nation in the world concert that it is entitled to, to which end her intellectuals and experts are marching, adding their thought to the most modern currents of progress. Ideals that are not aggressive or attempt to compete with or put obstacles in the way of the initiatives of any other nation; on the contrary, they aspire to co-ordinate ours with theirs, but providing our own with the awareness of our historic value and our future possibilities."<sup>13</sup>

Spanish propaganda was clear and precise, always trying not to raise doubts among the major powers, in order to avoid their reservations about putting the strategic weapon of controlling access to Africa through the tunnel, in its hands. This is the reason why the Spanish always claimed they had no imperialist ideals, based on the true fact that they had a very small number of colonies. All of this was highlighted by Spain's colonial experience in Latin America and their ties with Africa through the Islamic culture that tried to expand Andalucia to include the rest of Europe. This gave things an aspect that was attractive enough to count on Spain in future European economic unions that, at the time, were considered as beautiful utopias<sup>14</sup>.

#### 5. International Response to the Project / Međunarodna reakcija na projekt

This privileged position had an impact on France, dividing the country's public opinion. On the one hand, the Toulouse Chamber of Commerce, along with most of the country, lent toward the straits and its tunnel as a nerve centre of Afro-European commu-

<sup>13</sup> *Comision de estudio del tunel submarino de Gibraltar (Gibraltar tunnel study commission)* (C.E.T.S.G. from its initials in Spanish): *El túnel submarino de Gibraltar. Estado actual de los trabajos*. Bola os and Aguilar. Madrid, 1934: 13.

<sup>14</sup> *Ibidem*: 13-14.

nication. On the other hand, the chambers of commerce of Marseilles, Algiers and Casablanca wanted to establish a Bordeaux – Marseilles – Algiers and Casablanca axis as an alternative<sup>15</sup>, which was really a struggle over economic interests aimed at isolating Spain and the sector of Morocco that she ruled, shifting the weight of trading relations to the Algerian-Moroccan axis, and extending it down to Dakar as a complementary port, thus safeguarding French interests.

Spain's interest was, in turn, to create a sector of renewed economic structure based on the interests of Southern France. The Straits sector could become an extensive free zone for setting up processing industries that were cheaper than the existing ones in equatorial colonial areas.

Thus, the ports of Ceuta and Larache were reinforced, along with the Alcazarquivir railway line, drastically reducing the importance of Tangiers, an international sector that did not come under Spanish influence. The French response was a pincer formed by the trans-Saharan route from Algiers – Oran – Niger and the Casablanca – Tazza – Oran line that would isolate the Spanish zone.

From this point of view, the link became the factor that ensured the future of Spanish influence and of France's high noon. As the Toulouse chamber of commerce clearly stated in 1934:

"We have been asking for an entente cordiale with Spain since 1911, to create an international railway line going to Morocco, to connect with the trans-Saharan line. This line would open the way to exploiting incalculable African riches, that would thus find a natural exit: the intercontinental railway. In the south of Spain, there is a geographic point of the greatest importance, which acts as a cork in the African bottle. The Spaniards must be persuaded that, if uncorked, African products will wash over them in rivers of gold on their way to Europe, and Spain will be the first and greatest beneficiary of this stream".<sup>16</sup>

The problem was that opinion was equally divided in Spain, without specifying the political importance the project had for the country. Paradoxically, detractors of the tunnel based their arguments on the danger of foreign interventionism, whereas the more optimistic considered the Gibraltar tunnel as the ideal weapon for making Spain an arbitrator in the concert of nations:

"... if, as seems possible and is being attempted, a regime of peace is established for five years, maybe for ten, reaching a Mediterranean pact, that would entail for us tougher military obligations than the defence of the Straits, the advantages for one of the two camps that Europe will inexcusably be divided into, that could be awarded to Spain, dispensing or not, passage through the tunnel, would be so great and, by using this, it would give her the importance and category of a great power. If she builds the tunnel under the Strait of Gibraltar, it would have the same consequences as a victorious military and naval campaign and, however, she would only have committed money, taking whatever share of the capital we wish, invested in wages for Spanish workers, currently unemployed, and material, which would provide a market for our industry and, in the end, increase the economy, converting Spain into a nation of intercontinental transit, riches and welfare. These ideas are so evident that there are offers of foreign capital that would bring large sums to our soils."<sup>17</sup>

This was not a gratuitous controversy. Up until this time, African communications were haphazard, dependent on the programmes of each country. In consequence, lines were not only independent of each other they also varied in design, depending on the country that built them. The gage of the railway lines alone varied from 0.5 metres to 1.44 m. It was not until the late twenties that common standards were considered for lines and connections, not just to benefit the African continent, but to open up communications to other territories.

<sup>15</sup> *Ibidem*: 15.

<sup>16</sup> Transcript in: *El túnel submarino de Gibraltar, o.c.*: 22.

<sup>17</sup> *Ibidem*: 106.

Up until this moment, the development of major lines that connected the four corners of Africa was based on particular colonial policies, like the axis the Portuguese tried to establish between the Atlantic and the Indian Oceans, connecting Angola with Mozambique; or the Cape to Cairo line, a genuine umbilical chord of the English North-South colonial route. Three major routes were planned, some of which went beyond the continent:

- Tangiers – Dakar, obviously French and for purposes of trade. Its aim was not just to connect the different coastal territories, but also to create an alternative to the European ports in their traffic with Latin America, taking the place of the Canary Islands as a port of call, given the greater proximity of Dakar with Africa. This was the only line to be built. It was started on the first of January 1928, it ran from Uxda (chosen provisionally by the French Parliament, whilst awaiting the final result of the Gibraltar tunnel project) to Dakar. In 1927, the port of Dakar covered 225 Ha and had more than two kilometres of piers and 25 Ha of breakwaters, freight warehouses, docks, sea cranes of over 50 metric tonnes, 4,600 m<sup>2</sup> of warehouses and 5 km of railway lines. Furthermore, when work started on the trans-Saharan line, the port was given the go-ahead to expand and add two more 1,500 m docks, making it one of the most important ports of the West African coast. For the Spanish, it had the attraction of crossing the Sahara<sup>18</sup>.

- Tangiers – Alexandria – Jerusalem. This line formed part of the great British dream of connecting most of their empire with railway lines. They also meant to connect the capital of Palestine with Baghdad, Mecca and even reach India. The Franco-Spanish stretch of Tangiers to Fez and the later link with Taza-Algiers-Constantine-Tunis-Gafsa was interrupted for a long time because of Italian reticence. Their stretch, from Tripoli-Misurata-Andjila, did not reach Alexandria until many years later, reaching Jerusalem via Ismailia, but there was no continuous line.

- The Trans-African. This is the most ambitious of the projects that were never finished. The idea was to connect the port of Tangiers with Cape Town. To this end, it would join up with the Trans-Saharan line, conceived by France for bringing African contingents from their different territories, to France as quickly as possible in case of war. This line would connect with the Belgian Congo railways, linking with the Cairo – Cape Town line. But England pursued a different policy in the territories of Tanganyika and Kenya, thus frustrating the project.

## 6. Works, Studies and Trials / Radovi, studije i pokušaji

Created, as we have seen, by a disposition of the 30<sup>th</sup> of April 1928, the commission responsible for carrying out a preliminary study of the technical characteristics immediately set to work. By April of the following year, they had decided on the terrain for the Spanish end of the tunnel. This was to be in Punta Pe a, near Tarifa. In the same month, Jevenois, accompanied by mining engineer Depuy de Lome, went to Morocco to locate the other end of the tunnel, which was sited on the left bank of the river Liana, between Punta Buara and Punta Cava, near Alcazasegur<sup>19</sup>. Six months later, an 800 m well was dug in La Pe a, a site next to Tafira. Along with other surveys done by the Geographic

<sup>18</sup> *Ibidem*: 45.

<sup>19</sup> Anonymous: *Sección informativa: El túnel bajo el Estrecho de Gibraltar*, "Revista Hispanoafriicana", April, 1929: 17.

Institute of Spain, this confirmed Jevenois' hypothesis in his draft project, with regard to the quality of the sub-soil. At the same time Spanish navy coastguards took soundings of the waters of the Straits to calculate the depth at which the tunnel should be<sup>20</sup>.

For Spain, however, these were conflictive years. In 1930 Primo de Rivera's dictatorship fell and on the 14<sup>th</sup> of April 1931, the king fled the country, leaving his royal prerogatives in suspension, but without abdicating, giving way to the II Republic. None of this affected the Gibraltar tunnel project, as, a few months later, the new regime published a decree creating the *Official Commission to study the submarine tunnel of Gibraltar*<sup>21</sup>.

The most urgent thing was to find out if it was possible to build a submarine tunnel, so they started to study the Earth's crust at the site where drilling was to start. A geological study of the continental part was necessary for this, which was done in three phases:

1. A detailed stratigraphic study of both shores and their immediate hinterland.
2. Survey reconnaissance of the tunnel entrance zones, once the probable tunnel route had been set.
3. Use geo-physical means to determine the nature of the terrain set at a greater depth than that reached by soundings and possible definition of vertical blocks where the tunnel would have to be sited.<sup>22</sup>

Oceanographic surveys were also carried out by the Spanish Oceanographic Institute and the Navy. Both institutions had two vital issues to solve to make the project feasible: the exact depth of the Gibraltar Strait and the characteristics of the submerged soil. This was no easy task: charts of the Straits contained important mistakes. Soundings were given up, as they lost their vertical angle due to the strong currents that pulled on the ships, making all the reading erroneous. Thus, ultra-sound was chosen, a technology that was just starting to be used at the time. As a result, errors of more than 100 metres were discovered in some places. With regard to studying the sea-bed at great depth, at that time, they did not have appropriate equipment for measuring the bed, which caused the attempt to fail<sup>23</sup>. The project was a novelty, there was no previous experience due to its magnitude, so technical problems arose, which had to be solved before work could start. Thus, the need for artificially ensuring the evacuation of water and rubble during construction was solved with theoretical solutions offered by Austrian and Dutch companies. The alleged techniques used to dig and perforate the sea floor were simpler<sup>24</sup>.

## 7. The End of the Utopia / Kraj utopije

Lack of means for obtaining exact data on the sea-bed of the Straits delayed the work, which were finally interrupted by the Spanish Civil War of 1936-1939. However, the desire to continue was taken on by the rebels (who finally won the war) to the point that in November 1936 a Dahir (A Decree of the Moroccan Sultan) was published to provide money to continue the tunnel studies<sup>25</sup>.

However, this was merely a symbolic gesture. The country was immersed in a terrible war and people only lived for victory. Jevenois took the side of the mutineering officers, he was promoted to Colonel and took command of the northern sector of Cadiz. He was promoted to the rank of Brigade General in 1938 and Chief of Artillery of the Southern Army. After the war, he was appointed Military Governor of Cadiz and died shortly afterwards, in May 1941.

20 *Ibidem*.

21 "Gaceta de Madrid", n. 437, 13<sup>th</sup> Dec. 1931: 7.

22 C.E.T.S.G.: *El túnel submarino de Gibraltar, o.c.*: 61.

23 Anonymous: *Trabajos efectuados por la Comisión de túnel de Gibraltar en 1933*, "Ingeniería y Construcción", Madrid, 1934. n.134: 669-670.

24 *Ibidem*.

25 "Spanish Gazette for the Area of Spanish influence in Morocco", n. 24, vol. II, 14<sup>th</sup> Nov. 1936: 1064-1065.

Even if events had not taken such a dramatic turn, we doubt that the Gibraltar tunnel project could have been successfully carried out at this time. Reconnaissance of the sea-bed in the Straits remained a problem without solution. Attempts to photograph the depths failed due to a lack of the right technology at the time. The composition of the rock to be perforated was also impossible to establish, as we have already seen. Starting to drill, therefore, would have been dangerous.

The Civil War was followed by World War Two (1939-1945), and this, in turn, by the U.N. embargo against Spain, which was not lifted until the Hispano-American accords of 1953. This was when the idea of the tunnel could once again be considered. The Institute of African Studies and the Directorate General for Morocco promoted an extensive cycle of conferences in 1954 and 1955, on transport across the Straits of Gibraltar. Several different proposals were put forward, resorting to all kinds of available means: Jáuregui said literally "*Euro-African relations are more of a problem of roads and highways*"<sup>26</sup>, José de Aguinaga called for the help of ferry boats<sup>27</sup> and Navascués Revuelta complemented the idea with the use of aeroplanes<sup>28</sup>.

Amid all these criticisms, two voices were raised, calling for road communication across the straits: Alfonso Pe a Boeuf, who contributed the novelty of offering the solution of a suspension bridge<sup>29</sup> and Carlos Ibá ez Ibero, who stuck to the idea of a tunnel.

This engineer belonged to a group of experts that had considered this kind of solution in the first decade of the 20<sup>th</sup> century. Nine years before Jevenois, Ibá ez had presented a tunnel proposal that was forgotten in the face of this opponent's brilliant project. Now, 40 years later, he presented three routes:

- A straight line from the Valdevaqueros entrance to Tangiers.
- From Enseada de Bolonia, heading west, to end up in La Punta Al Boassa.
- From Cape Trafalgar to Punta Malabata.

## 8. Epilogue / Epilog

Direct communication between the two continents, as we know, did not take the shape of any specific work. The year after this latest project, Morocco gained independence and was re-united; within 10 years, the whole of North Africa was free and independent. In consequence, a radical change occurred in the policies and economic approaches of the colonial powers. If the project had been thus far considered as a work for the benefit of Spain and, in a broader sense, for Europe, attention now had to be paid to the opinion and the will, not only of the new nation, but also of the continent's other territories. Africa was no longer a supply depot for European nations, or a sales post for selling the stocks of the markets of the Old Continent. Because of all this, tunnels and bridges, feasible or not, were no longer so comfortably profitable. Moreover, de-colonialisation had created a new problem: in the barrier between the North and the South, put in place after African independence, the Straits were a comfortable way of filtering communications with Africa. Opening up a new two-way access meant facilitating illegal immigration and with it, control of access to the rich countries; and that was the last thing that Europe wanted at a time when it was gradually becoming a centre of welfare in the midst of a world of backwardness and poverty.

■

<sup>26</sup> Jáuregui, J. J., *Las comunicaciones ibero-africanas en el pasado y en el presente*, in: *Las comunicaciones euro-africanas a través del estrecho de Gibraltar*, tome III, the Supreme Council of Scientific Research, Madrid, 1956: 50.

<sup>27</sup> Aguinaga, J., from: *Cooperación que los transportes nacionales pueden prestar para desarrollar el tráfico euroafricano*, in: *Las comunicaciones euroafricanas a través del estrecho de Gibraltar*, tome III, the Supreme Council of Scientific Research, Madrid 1956: 66.

<sup>28</sup> Navascués R. J.: *Conveniencia de iniciar con la carretera la continuidad en las comunicaciones euroafricanas* in: *Las comunicaciones euroafricanas a través del estrecho de Gibraltar*, tome II, Supreme Council of Scientific Research, Madrid, 1956: 115-116.

<sup>29</sup> This subject was dealt with in our article *El túnel de Gibraltar*, in the press.

**Sl. 1. Gibraltarska stijena**

FG. 1. The Rock of Gibraltar



**Sl. 2. Gibraltar - satelitska snimka**

FG. 2. Gibraltar - satellite photograph



## Sazetak • Summary

**Kolonijalna utopija**

## Kopnena veza preko Gibraltarskog tjesnaca

Pokušaji da se izgradi veza između Europe i Afrike pojavili su se sredinom XIX. st. kada je razvoj tehničkih mogućnosti dozvolio čovjeku da počne razmišljati o prevladavanju fizičkih zapreka.

Francuski inženjer Laurent de Villedemil napravio je prvi projekt 1860. g. i od Španjolske vlade dobio koncesiju da izgradi tunel. Projekt je bankrotirao jer su investitori povukli kapital zbog tadašnje političke nestabilnosti u Španjolskoj. Uslijedili su drugi projekti: Juan Bautista Berlier na prijelazu stojeća, Henry Bressler 1918. g., itd. Španjolske studije stigle su kasnije ali su bile sveobuhvatnije. Inženjer García Faria je pregovaračima na *Konferenciji Algericas* (1906. g.) predstavio željezničku vezu između španjolskih i alžirskih željeznica koja je uključivala studiju za podvodni tunel. Trinaest godina kasnije drugi inženjer, Carlos Mendoza, predložio je mrežu cijevi koje bi igrale ulogu tunela.

Međutim, prvi ozbiljan projekt predstavio je inženjer i pisac Mariano Rubio y Belve. Njegov je pristup bio prije znanstven nego intuitivan te je izdao knjigu *Veza preko Gibraltarskog tjesnaca* s mnogo tehničkih podataka i s teoretskom razradom. Njegov rad nije sadržavao dobru geološku studiju, ali je s druge strane to bio prvi projekt koji je potražio povoljniju iako dužu trasu.

Neko se vrijeme na sve zaboravilo, a tada je euforija koja se digla oko projekta tunela ispod Kanala *La Manche* ponovno probudila duhove. Artiljerijski pukovnik Pedro Jevenois postavljen je na čelo osuvremenjivanja projekta. Plan napada je podijelio u četiri stupnja:

1. Odrediti koja su iskustva i ispitivanja potrebna da bi se izradili planovi;
2. Pribaviti potrebna sredstva i ponudu za ugovor od države i od privatnih izvora;
3. Nakon izrade planova, izgraditi tunel;
4. Nakon izgradnje tunela, osnovati društvo koje će njime upravljati.

Jevenois je 1926. g. napisao knjigu o izvedivosti izgradnje tunela; zamisao se zasnivala na tuđim iskustvima pri gradnji američkih, engleskih, francuskih i njemačkih tunela, ali se uglavnom zasnivala na modelu nedavno izgrađenih tunela *Simplon* i *St. Gothard*. Jevenoisov je pristup imao 18 točaka koje su počivale na 9 premisa Charlesa Roluta za izgradnju dugih podvodnih tunela. U to vrijeme je projekt za Tunel *La Manche* već bio dosta odmakao pa je Jevenois imao priliku da odmah počne graditi Gibraltarski tunel koristeći se znanjem i materijalima koji su se koristili za Tunel *La Manche*. Arhitekt je zagovarao odbacivanje najkraće trase da bi se izbjegla prevelika dubina.

Rad koji je 1927. g. predstavio Jevenois bio je tek hipoteza, ali je ipak bio dobro primljen. Projekt je pobudio tako veliko zanimanje da su između rujna 1927. g. i travnja 1928. g. počele birokratske pripreme na osnovi kojih je Međunarodno povjerenstvo za Sredozemlje izdalo preporuku Španjolskoj da sprovede intenzivno proučavanje tjesnaca.

Politički trenutak za početak projekta bio je idealan. Poslije dva desetljeća borbi, Španjolska je uspjela ugušiti pobunu u svojim marokanskim posjedima i željela je pokazati ostalim europskim zemljama da je sposobna kolonizirati zauzeta područja.

Međunarodna zajednica pružila je jednoglasnu podršku; samo su sjeverna Francuska i kolonije Francuske sjeverne Afrike bile suzdržane. To je bilo i za očekivati, jer bi pravac koji su prihvatile kolonijalne sile povezao željezničke mreže Europe, Afrike i Azije kroz tunel i dovele do opasnosti da neki predjeli izgube na važnosti kada se promijene pravci željezničke mreže.

Ispitivanja su započela i u Maroku i u Španjolskoj. Tada su Španjolski građanski rat (1936-1939) i Drugi svjetski rat (1939-1945) prekinuli radove, a nakon toga uslijedio embargo je Ujedinjenih naroda protiv Španjolske (1945-1953). Kada je embargo prekinut te se činilo da je sazrijelo vrijeme za ponovni početak rada na projektu, Maroko je dobio nezavisnost.

Kako svi znamo, projekt nikada nije ostvaren, velikim dijelom zbog korjenitih političkih i gospodarskih promjena u Sjevernoj Africi. Ona više nije bila područje s kojeg su se snabdijevale europske sile. U to se vrijeme počeo pojavljivati još jedan problem koji se, kako su prolazile godine, sve više pogoršavao; ilegalna imigracija. Ljudi su izgubili zanimanje za Gibraltarski tunel velikim dijelom i zbog toga jer je tjesnac prirodna granica, sredstvo kontrole tijekom doseljavanja koje je stvorila prošla kolonijalna politika u Africi.

Alberto Darias Principe

Prof. Alberto Darias Príncipe, PhD, was born in 1945, in the Canary Islands (Spain). He got a degree in History from the University de La Laguna with his research project *Monuments of the Island of La Gomera*. He later got a PhD with a thesis entitled "Architecture and Architects of the Western Canary Islands 1874-1931", which won a special prize. These two subjects were the focus of his research in the early years of his professional career. He started teaching at University de La Laguna and later won a place as Resident Professor in History of Art in a public competition. He mainly taught about modern and contemporary architecture. At the same time, he did research work, which has led to the publication of a large number of articles in books and journals on architecture and town planning in the Canary Islands in the XIX and XX centuries.

In recent years, his research work has been focussed on the fields of counter-reformist Baroque iconography, XIX century Latin American architecture from the standpoint of its search for a national identity and Spanish architectural and planning influences during the time of the Protectorate in the north of Morocco.

Professor Darias has also done much work on historic-artistic heritage, as a consultant historian in the restoration work done on many different churches, palaces and houses; as a member of the Island Heritage Committee for the islands of Tenerife and La Gomera and as an advisor to the Canary Island Government. He currently manages the ecclesiastical heritage of the western Canary Islands.

Alberto Darias is a member of the Institute of Canary Island Studies, the Institute of Hispanic Studies and is the special representative of the Royal Academies of Fine Arts of San Fernando (Madrid), San Carlos (Valencia), Santa Isabel de Hungria (Seville) and San Telmo (Málaga). He is very active on the lecture and course circuit in cultural organisations in the Canary Islands and in Universities on the Spanish mainland and in Latin America.

Prof. dr. sc. Alberto Darias Principe je rođen 1945. g. na Kanarskim otocima (Španjolska). Diplomirao je povijest na Sveučilištu La Laguna sa znanstvenim projektom *Spomenici na otoku La Gomera*. Kasnije je obranio doktorsku disertaciju "Arhitektura i arhitekti zapadnih Kanarskih otoka 1874.-1931.g.", koja je dobila posebnu nagradu. Te su dvije teme bile u središtu istraživanja u počecima njegove stručne karijere.

Počeo je predavati na Sveučilištu La Laguna i na javnom natječaju dobio mjesto profesora povijesti umjetnosti. Uglavnom je podučavao modernu i suvremenu arhitekturu. Istovremeno se bavio znanstvenim radom koji je doveo do objavljivanja velikog broja članaka u knjigama i časopisima o arhitekturi i urbanizmu na Kanarskim otocima u XIX. i XX. stoljeću.

U najnovije vrijeme uglavnom istražuje baroknu ikonografiju protureformacije, arhitekturu XIX. stoljeća u Latinskoj Americi sa stanovišta potrage za nacionalnim identitetom, te španjolski utjecaj na arhitekturu i urbanizam za vrijeme Protektorata u sjevernom Maroku.

Profesor Darias se mnogo bavio i povijesno-umjetničkom baštinom. Bio je savjetnik za povijest tijekom restauracije mnogih crkava, palača i kuća, član Otočkog odbora za baštinu otoka Tenerife i La Gomera, te savjetnik Vlade Kanarskih otoka. Sada upravlja crkvenom baštinom zapadnih Kanarskih otoka. Alberto Darias je član Instituta za studije Kanarskih otoka, Instituta hispanjskih studija i posebni predstavnik Kraljevskih akademija likovnih umjetnosti San Fernando (Madrid), San Carlos (Valencia), Santa Isabel de Hungria (Sevilja) i San Telmo (Malaga). Vrlo je aktivni predavač u kulturnim organizacijama Kanarskih otoka, te na sveučilištima kopnene Španjolske i Latinske Amerike.

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