

Philippe Bunau-Varilla, *Nicaragua or Panama*, 1901

As part of a series of speeches delivered in the United States, Philippe Bunau-Varilla, the central figure pushing for the United States to build the canal in Panama, successfully made the case that a Nicaraguan route held greater risks than one in Panama. Though he claimed here not to represent any private interest, he was clearly representing his own financial interests, and he did profit handsomely from the U.S. purchase of the assets of the French company.

Preface: I firmly believe that when the Truth is advancing nothing can stop it; I firmly believe that its irresistible pressure will overthrow any dam of prejudice erected in order to hold it back.

At the same time I think that individual efforts may largely help the truth in its progress, by clearing from its path the obstructions of ignorance.

This was my aim when I answered affirmatively to three American friends who invited me to come to this country of free discussion in order to say publicly what they had heard in private conversation with me in Paris.

I am not here as the representative of any private interest; I came to defend a grand and noble conception which gave me several happy years of struggle and danger, and for which I suffered many years of anxiety, during which I do not remember one hour of despair.

It has been to me a great privilege to have the opportunity of exposing to the clear light of day all the irrefutable facts which show that Providence has subjected to a severe test the sagacity of man, by giving apparently to the Isthmus of Nicaragua all good qualities, and to the Isthmus of Panama all defects for an interoceanic waterway, when in reality it has given to the latter and refused to the former all the attributes necessary for the establishment of this natural highway of nations.

I have been happy to speak in this great country, where the first official word of justice for Panama has come from the eminent Isthmian Canal Commission.

My purpose has been attained. I have worked for the scientific Truth on one of those fields, where, as Mr. Carnegie recently and justly said, there is no room for selfish and private aims.

Gentlemen: It will be my effort to lay before you a series of facts officially or scientifically established and to show at their clear light the real aspect of this question of paramount importance.

Those facts, drawn from absolutely reliable sources, will help to pierce the dense mist of prejudice and erroneous impressions that floats over public opinion, which was misled both by the deceitful appearance of the natural conditions of the two canal routes of Nicaragua and Panama, and at the same time by the false idea that the Panama enterprise was paralyzed by technical impossibilities, when, on the contrary, the financial difficulties were the only cause of such paralysis, and came when, after a long struggle, all technical problems had been entirely solved.

It would have been a short time ago impossible to make the same demonstrations with the same authoritative statements because, though the facts that I could have brought had been the same, I would have been obliged to place them under the authority of the books that I published nine years ago, and I would have hesitated to ask from you so much credit for them...

I propose now to touch upon [a]... point which does not concern the construction proper of the Canal, but has reference to future contingencies, and which was not discussed by the United States Isthmian Canal Commission in its preliminary report.

I wish to speak of a danger arising from seismic disturbances, both during construction and after.

In Panama, there is within a distance of one hundred and eighty miles from the Canal no volcano, even extinct. The Isthmus there, since its formation in the early quaternary period, before man appeared on the earth, has not been modified.

This is quite the contrary in Nicaragua, which has been always the site of seismic convulsions, whose lake was formerly a gulf of the Pacific Ocean, and whose name was associated with the most terrible volcanic explosion ever recorded in history before the Krakatoa explosion in Sound's Islands.

The explosion of the volcano Coseguina in 1835 lasted 44 hours, the noise was heard at a distance of 1000 miles, the ashes were brought 1400 sea miles by the winds, the mass ejected into the air was calculated to have covered a surface equivalent to eight times the surface of France, and the volume was calculated to be equal to 50 cubes having sides of 1100 yards, which allows me to say that during these 44 hours the volcano *ejected every six minutes a volume of stone and ashes equal to the total volume of the prism of the Nicaragua Canal*, as it was calculated by the Nicaragua Canal Commission, and which will necessitate eight years of excavation.

In the very center of Lake Nicaragua is a volcano in constant activity, the Omotepe, whose last great eruption occurred in 1883.

Between the two above named volcanoes we find a series of volcanoes in recent or continuous activity, the Hell of Masaya, on the shore of Lake Nicaragua, the celebrated Momotombo, on the shore of Lake Managua, the volcano of the Pilas, which was born in 1850, the Santa Clara, the Zelica, the Nindirí, being the best known of them.

The continuity of volcanic disturbances is stated in an appendix to the Nicaragua Canal Commission's report: "In the northwestern part of Nicaragua slight earthquakes are frequent. *Scarcely a month passes without one or more being noticed.* The center of these disturbances is always near the line of the Nicaragua volcanoes; *the line of volcanoes begins with Madeira* (near the Omotepe), at the southern end, in Lake Nicaragua, and terminates at Coseguina, at the northern end, near the gulf of Fonseca."

Two most important facts have been recently established by Mr. Bertrand, foremost geologist and member of the Institute of France.

(1) *The Lake Nicaragua is one of the three lines of least resistance in Central America, which are a site of election for great seismic disturbances.* It is the line of depression between the Costa Rican volcanoes and the Nicaraguan, and plays the same part as the other two: the bay of Fonseca, which is a volcanic lake characterizing the depression between the Nicaraguan and Salvadorian volcanoes, and the Lake Pacayan, characterizing the depression between the Salvadorian and Guatemalan volcanoes. These two last lines of least resistance have been the site of the most terrible convulsions owed to the Coseguina for the former, and to the Fuego (Fire) for the latter.

(2) *The underground fire is going south, and increasing in Nicaragua.* From the figures given by Mr. Bertrand, I calculated that before the nineteenth century, out of all the great explosions or earthquakes recorded, 45% belonged to Guatemala, 35% to Salvador, and 20% to Nicaragua, whereas in the

nineteenth century, only 30% belonged to Guatemala, 45% to Salvador, and 25% to Nicaragua, showing an evident tendency to a displacement of the activity southward and an increase in Nicaragua.

To justify these figures one can say that several volcanoes became extinct in Guatemala, and that none was extinct in Salvador nor in Nicaragua, but, on the contrary, that two were born in Salvador, Izalco, in 1770, and Ilopango, in 1880, and one was born in Nicaragua, that of Las Pilas, in 1850.

Danger for Construction—The continual earthquakes may have a fatal influence on the definitive transformation from half-liquid mud into hard stone, of the concrete, which will during eight years be continually poured in the great Boca San Carlos dam; these violent shocks, interfering every month or more with the gradual crystallization of the elements of concrete, may destroy their reciprocal adherence, and ruin the perfect homogeneity of the solid mass which is imperatively necessary for the part it has to play.

Danger for the Canal once Built—It is entirely false to compare the equilibrium of dams and locks with that of a high tower or of a church. A wall or tower even fissured can stand after an earthquake. A longitudinal fissure in a dam, which will not alter its equilibrium as a wall without pressure of water, would mean its immediate overthrow when the water pressure is exerting its force upon the surface of the inside fissure.

Outside of the impending and terrible danger of seeing ruined the dam or the locks by a great seismic commotion, one must not forget that there is great probability of seeing formed in the sea of Nicaragua, which is 100 miles long and 45 miles wide, one of those terrible tidal waves which were so destructive in Lisbon (earthquake of 1752), and Krakatoa, 1883, the latter being 100 feet high and the former 40, and which caused unlimited disaster.

It must be borne in mind that these terrible menaces would mean, if realized, not only the destruction of that costly Canal, but the ruin of the immense interests of both sides of America, which will have been developed by the great waterway and receive a death blow by its paralyzation.

Transformation of the Panama Canal into a Bosphorus—Nothing similar can be feared in Panama, as no trace of any local volcanic activity may be found on that Isthmus, whose rare and small seismic vibrations come from distant centers.

The future, on the contrary, far from being open for destruction, is open for a gradual transformation from a lock canal into a level canal, into a Bosphorus, which means a rapid transit in five hours from ocean to ocean. This can be done without stopping or troubling the navigation even for a quarter of an hour, by following the solution I have given years ago to this question, which is extremely simple, and consists, all engineers will understand me, in making the two gates of a lock of the same height.

Conclusion: The facts that I have related demonstrate the following statements:

I. It is very questionable whether the continuous earthquakes will allow the construction, on the Nicaragua route, with all its indispensable qualities, of a substantial masonry dam, which is the key of the whole Canal.

II. Admitting a dam could be built, the Nicaragua route, whatever may be the engineering skill displayed and the expenses made, will *never acquire* the two most essential qualities necessary to an interoceanic canal,—*continuity of operation* and *security of transit*.

The large ocean steamers will have there to struggle, deprived of any means of resistance, against the combined efforts of the continuous violent gales, of the heavy river currents, of the impediments resulting, of the constant modifications of the depths in the channel, and of the presence of the numerous dredges that will have to keep the way open, and this when they will be steering with great difficulty around an extraordinary number of curves, the short radii of which ought to be, in themselves, considered as incompatible with the navigation of big ocean ships in a narrow channel.

The ships will also have to meet two bad, exposed, and dangerous passages, when going from the Atlantic into the Canal and from the Canal into the Lake of Nicaragua.

One is allowed to say that *continuity of transit and safety of navigation will be constantly at the mercy of conflicting elements and beyond the control and prevision of man.*

III. If the experience of four centuries is not a mere word, if the undisputable proofs, written in letters of fire on the surface of the soil, of the continuous violent and increasing volcanic activity in Nicaragua, are not a mere dream, the route over that Isthmus is not only eventually exposed to, but certain, sooner or later, to be the prey of, that uncontrollable power of nature before which flight is the only resource.

If one thinks that not only the enormous cost of such a waterway would be at stake but also the very basis of the prosperity, the wealth of the millions of people who will settle on the west coast of North America, as soon as the construction of the Canal will join them with the other side of the continent and with Europe, one hesitates to calculate the consequences that would result from one of those seismic convulsions, which most probably will be still more terrible in the future than they have been in the past on that part of the Isthmus,

To prefer definitively the Nicaragua route to the Panama route, the unstable route to the stable one, would mean to prefer the stability of a pyramid on its point to the stability of a pyramid on its base when to that stability is attached the prosperity and welfare of a whole continent.

IV. The Panama route, having no winds, no currents (except on rare occasions), no sharp curves, no sediments, no bad harbors, no volcanoes, enjoys to the highest degree the three essential qualities totally wanting for the Nicaragua solution,—*continuity of operation, security of transit, stability of structure.* Outside of that it is three times shorter, will cost much less than the Nicaragua route and is easily transformable into a Bosphorus, the only form that will definitely answer to the world-wide interests to be served by the route, and allow of a passage from ocean to ocean in five hours.

Philippe Bunau-Varilla, *Nicaragua or Panama: The Substance of a Series of Conferences made before the Commercial Club of Cincinnati... Before the Princeton University in New Jersey, etc., etc., and of a Formal Address to the Chamber of Commerce of the State of New York* (New York, The Knickerbocker Press, 1901).