PLAGUE IN THE AMERICAS (*Continued*)

X. VENEZUELA

Venezuela was, next to Bolivia, the last South American country to be invaded by plague (1908), and the infection was soon eradicated from ports and the capital, but it apparently persisted in the interior.

The Republic is situated between 73 and 24° West Longitude and 12 and 1° North Latitude, and has an area of 352,170 square miles and a population of about 3,491,159. The climate varies according to altitude, and may be divided into three zones: the torrid, from the coast to 1,750 feet (temperature 78 to 82 F); the temperate, from 1,750 to 6,500 ft. (temperature from 64 to 77) and the cold, over 6,500 ft. (35 to 38 F). There are three mountain ranges, the Andean, extending from Colombia, the coastal, and the Parima, the last rising from the tablelands of Venezuelan Guiana. The country is well forested. The rainy or winter season on the Llanos or plains lasts from April to October, and the dry season from November till March; seasons are not so definitely marked in the temperate zone as in the lowlands.

As reported elsewhere (See General Review), plague first appeared in Venezuela about April, 1908, attacking La Guaira and Caracas, the original infection possibly coming from Trinidad or Ecuador. The most accepted version attributes the introduction of the disease to the landing at La Guaira in January, 1908, by the Italian steamer *Citá de Torino* from Colón, of the body of a priest from Guayaquil, Ecuador.[1] The four men who buried this body were the first individuals to be attacked by plague, although no diagnosis was made. The nature of the disease remained in doubt for several weeks, until the leading bacteriologist of the country, Rangel, after a series of studies, made the diagnosis of plague on April 15, 1908.[2] The number of cases in La Guaira from the middle of January, when the disease is assumed to have first appeared, to April 15, has been estimated at 25. From April 15 to July 10, 1908, 64 cases with 38 deaths were reported in the port. As soon as the diagnosis was made, the accepted preventive measures were put in force: isolation of the patients in a camp, disinfection of patient's homes, rat poisoning and trapping, use of serum, and anti-plague vaccination of all the people in the city. No cases were reported after July 10, nor has the disease reappeared in the port.[3]

With Caracas but 16 miles from La Guaira, precautionary measures to protect the capital were taken, including the stopping of railroad and

[1] Plague was first diagnosed in Guayaquil in February, 1908, in rats. However, suspicious cases were said to have occurred in humans in January in the wharf area. (See Ecuador). The country had been fearing an outbreak of plague since it appeared in Peru in 1903.

[2] The overwork thrown by this extra research, and especially the effect of the blame for not sooner reaching a diagnosis, upon a highly strained nervous system, may have contributed to Rangel's suicide in the early part of the following year.

[3] Acosta Ortiz, P., and Razetti, L.: "Actas IV Conf. San. Int. (Panamericana)," 1909-10, pp. 201-204

other traffic and establishment of a "sanitary cordon." Nevertheless, on April 18, a case was reported in Caracas in a woman living in the vicinity of the railroad station, whose people worked on the railroad line. From April 18 to October 20, 1908, there were 78 cases (in seven months); from October 21, 1908, to May 20, 1909, 4 cases (in seven months); and from May 21, to October 20, 1909, 29 cases in 6 months.[3] There were 39 cases in 1910, and 42 in 1911, sporadic cases in 1912, 1913 (9 cases), and 1914 (1 case). The next three years were apparently free, but two cases were reported in 1918, and in 1919 there were 6 cases in Caracas which had been imported from the outlying districts and centered in the public market.[4] The last case in Caracas was on September 9 of that year. Among 3,239 rats inspected in 1919, 15 infected ones were found, the last in May.

Up to 1918 the most remarkable feature of Venezuelan plague had been its failure to spread, since the La Guaira focus had been eradicated and no cases had been reported outside of Caracas. By 1918, however, the Valles del Tuy region in the State of Miranda, just outside the city, had become infected; the disease being epidemic there in the latter part of the year and early 1919. Communication between the region and Caracas was forbidden, but as already observed, some cases reached the city. Cases also appeared in Las Canales, at the edge of Valles del Tuy, in April 1919, this focus being the origin of one of the Caracas cases (Apr. 23 case). Emergency isolation hospitals were set up in the infected regions, and also observation houses for contacts, both types of building being kept protected against rats and fleas. An intensive rat-proofing campaign both in Caracas (especially the market and vicinity) and in Valles del Tuy, was carried out.[5]

The total number of cases in the 1919 outbreak was reported as 113, with 73 deaths.[6] The last case in Valles del Tuy was on September 16.

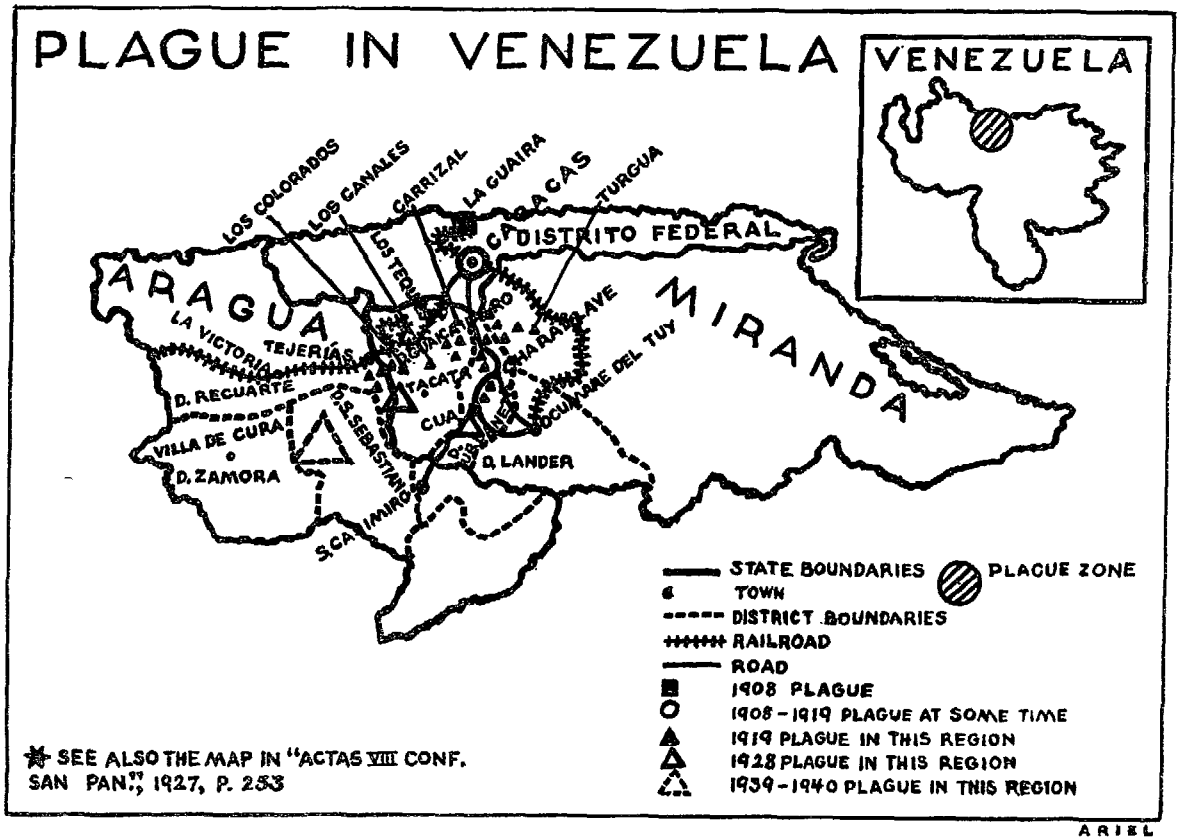
For nearly a decade plague disappeared from Venezuelan statistics.[7] At the VIII Pan American Sanitary Conference (Lima, October 1927), the Director of Health was able to state that "the present history of Venezuelan plague offers one more proof that epidemics of this disease

[4] The market was at that time in very poor sanitary condition, with many rat and flea harbors, and daily received a great quantity of vegetables and other goods from Valles del Tuy. The place was immediately cleaned up and rat-proofed.

[5] Chacín Itriago, L. G.: "La Peste Bubónica en Venezuela," "Actas VIII Conf. San. Pan.," 1927, pp. 252-266.

[6] Dirección de Sanidad Nacional: "Informe correspondiente al año de 1919 . . . al Min. de Rel. Interiores," Caracas, 1920, p. 41. The 113 cases included 21 C 16 D from Charallave (Jan.-Feb.); 40 C 16 D. from Las Canales (Apr.-May); 18 C 8 D from Los Colorados (June); 18 C 13 D from Turgua and Las Adjuntas (July-Aug.); 10 C 9 D from La Montaña and Carrizal (Sept.-Oct.), and the 6 C 5 D from Caracas (Jan., Apr., Sept.) characterized as "imported."

[7] At the time it was maliciously rumored in Caracas that since the regime then in power was completing its first 10-year term in August, 1919, its chief had ordered that plague should "disappear" from the country. It is a fact, however, that the campaign against the disease had been pushed with vigor and skill.


PLAGUE IN VENEZUELA
VENEZUELA
LOS COLORADOS
LOS CANALES
CARRIZAL
LA GUAIRA
CARACAS
TURGUA
D. FEDERAL
ARAGUA
LA VICTORIA
TEJERÍAS
MIRANDA
D. RECUARTE
VILLA DE CURA
D. ZAMORA
D. LANDER
STATE BOUNDARIES
PLAGUE ZONE
TOWN
DISTRICT BOUNDARIES
RAILROAD
ROAD
1908 PLAGUE
1908 - 1919 PLAGUE AT SOME TIME
1919 PLAGUE IN THIS REGION
1928 PLAGUE IN THIS REGION
1939 - 1940 PLAGUE IN THIS REGION
SEE ALSO THE MAP IN "ACTAS VIII CONF. SAN PAN.", 1927, P. 253
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are relatively easy to combat, and may be conquered in a few weeks," although admitting that the complete elimination of the disease is a difficult task.[8] The transactions of the Conference were hardly off the

Plague in Venezuela: 1908–1940

Year	Caracas		La Guaira		State of Miranda										State of Aragua La Florida		Totals	
					V. del Tuy		Canales		Tácata		Urdaneta		El Altar					
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1908	78[a]		64[b]	38													142	38[a]
1909	29[a]	45[a]															29	45
1910	39																39	
1911	42–56[c]																42–56[c]	
1912	10[c]	10[c]															10[c]	10[c]
1913	9																9	
1914	1																1	
1915	0																	
1916	0																	
1917	0																	
1918	2																2	
1919	6[d]	5[d]			67	46	40	16									113	67
1920																		
1921																		
1922																		
1923																		
1924																		
1925																		
1926																		
1927																		
1928									8[e]	6[e]	9[e]	7[e]	5[e]	5[e]			22[e]	18[e]
1929																		
1930																		
1931																		
1932																		
1933																		
1934																		
1935																		
1936																		
1937																		
1938															P?			
1939															11[f]	9[f]	11	9
1940																		
1941																		
	216C		64C		129C				80D						11C	9D	420C	

[a] Total deaths for Caracas 1908–1909, 45.
[b] April 15–July 10. An estimated 25 cases occurred prior to this.
[c] *U. S. Pub. Health Reports*, 1911–1912.
[d] Imported.
[e] Including suspected cases and deaths.
[f] December 7, 1939 to January 4, 1940.
P—Plague reported present.
C—Cases.
D—Deaths.

press when the Venezuelan health authorities were reporting (February–March 1928) another outbreak in two different localities in the

[8] Chacín Itriago, *supra*, p. 257.

State of Miranda (the same State previously infected), on the border of Aragua State, about 60 miles from Caracas. The last case was reported on March 17, 1928. Examination of local rats proved negative. There were about 25 cases in all which, though not bacteriologically confirmed, were highly suspicious of plague; a number were of the pneumonic type.[9]

No further cases of plague were reported from Venezuela for another decade, although it was later stated that sporadic, unconfirmed cases had continued to appear at rather long intervals in the Miranda-Aragua region.[10]

Then, toward the end of 1939 and beginning of 1940 (Dec. 7 to Jan. 4), an outbreak of plague occurred with 11 cases, 9 deaths, in the La Florida area, State of Aragua. This is an extensive, mostly mountainous region, at an altitude of 600 to 1,000 m., with a population living in small towns and hamlets and scattered straw huts; on the edge of the region are the larger towns of La Victoria, Villa de Cura, and Tejerias, accessible by automobile during but part of the year. Outbreaks were said to have occurred in the area in previous years, always preceded by epizootics in rodents.[10] There was said to have been an outbreak in the La Florida region in 1938. Of the 11 cases in the 1939–40 epidemic, 7 were bubonic and the rest septicemic. At the request of the Venezuelan authorities, the Pan American Sanitary Bureau sent, first, Dr. Newton E. Wayson, of the U. S. Public Health Service, and later, Dr. John D. Long, Senior Traveling Representative of the Bureau, to study the outbreak. Dr. Wayson confirmed the diagnosis, and conferred with the Venezuelan health officers about the situation, presenting recommendations, later supplemented by Dr. Long, for dealing with the epidemic. A National Antiplague Service was organized to take charge of the work, and arrangements were made to send a Venezuelan technician, to study the methods of the plague laboratory in Peru.[11]

No further cases of plague have been reported from Venezuela.

Rats.—According to a study of 2,066 live rats captured in Caracas

[9] Dirección de Sanidad: "Informe correspondiente al año de 1928 que el Director de Sanidad Nacional presenta al Ejec. Fed. por organo del Min. de Rel. Int.," pp. 158–177. On Feb. 24, 1928, three suspicious deaths were reported from the *hacienda* El Amparo, State of Miranda; and 5 suspicious deaths from *hacienda* El Altar, on the Aragua boundary. An investigation was made at the former place, which was a coffee plantation in the Municipality of Tácata, District of Guaicaipuro. Small fruits were also raised, as well as horses. The *hacienda* had 17 straw *ranchos* or shacks inhabited by 97 persons. There were 8 cases in all, with 6 deaths, of "tetanus" and "*pulmonía*" from Feb. 12 through Mar. 1; of the nonfatal cases, one had pulmonary symptoms and the other had an inguinal bubo and was ill 26 days. On March 7, 1928, the Ministry of Foreign Relations reported the cases to be pneumonic plague. On March 7, 5 suspicious deaths in one house were reported from Marín de las Rosas, a small hamlet in the Urdaneta District of Miranda State. On arrival of the commission it was found that 6 persons had died and two more, contacts of the others, were ill. One died on March 30, the other recovered. One other case was said to have occurred, with a total of 9 cases 7 deaths Plague serum and vaccination were used after the arrival of the commissions.

[10] García Maldonado, L.: "Comunicación a la Oficina Sanitaria Panamericana," *Bol. Of. San. Pan.*, July 1940, p. 692.

[11] García Alvarez, Julio: "Memoria y Cuenta del Ministerio de Sanidad y Asistencia Social, 1940," (*Bol. Of. San. Pan.*, Oct. 1941, p. 1001); and "An. Rep. Pan. Am. San. Bur., 1939-40," (Pub. 155), p. 30.

from March 4 to June 29, 1927, 95.83% of the rats were *R. norvegicus*, and the other 4.16% *R. rattus*. Of the *norvegicus*, 1.69% were albino or melanistic and 1.21% had white rather than gray or brownish bellies.[12]

Fleas.—Fleas captured from 1,660 rats from Feb. 22–May 5, 1927 were also classified, with the following result: 1,244 fleas; 94.21% *X. cheopis* (1,172; 3.85% *X. brasiliensis*; 1.52% *C. felis* 1.52% and *L. musculi*, 0.40%. The *Cheopis* index was 0.70, the flea index 0.74, and the *brasiliensis* index, 0.03.[13]

Seasonal distribution.—Plague appears to have been most prevalent during the period between February and October, though there were cases in other months as well. In the original outbreak, plague was present in La Guaira from April (and probably earlier) through July 1908; in Caracas, from April 1908 to October 1909. In 1919 for the whole country the highest incidence was in April–September (89 out of 113); followed by January–February (24). There were no cases in May, nor in October–December. The pneumonic cases of Miranda State in 1928 occurred in February and March. The 1939–40 outbreak in Aragua was in December–January.

Kinds of plague.—In the La Guaira outbreak, 48 of the 64 cases from Apr. 15 to July 10, 1908 were bubonic (75%); 6 pneumonic (9%) and 2 septicemic. There were 38 deaths (59.37% mortality). In Caracas, 1908–1909, there were 83 bubonic cases out of 107 (77%), 12 bubonic with pneumonic complications; 4 pneumonic (3%); 6 septicemic; 1 pneumonic with intestinal involvement; and 1 generalized bubonic. There were 45 deaths, or a mortality rate of 42%. In 1919 there were 64 bubonic (55%), 34 septicemic, and 15 pneumonic (13%) of the 113 cases; there were 67 deaths, (mortality, 59.29%). A number of the 1928 cases in Miranda State were pneumonic; and 4 of the 1939–40 cases in Aragua were septicemic.

Control.—The control measures taken have been discussed in connection with the various outbreaks. Rat-destruction and rat-proofing are required by law.[14] Rats are also captured and examined.

Vaccination and serum-therapy.—While the isolation of cases, observation of contacts, and destruction of rats and rat harbors have been the principal weapons used against plague, vaccination and serum-therapy have also been used by the Venezuelan authorities. Dr. F. Mendoza reported that in cases treated with large doses of serum from the beginning of the illness, and by extirpation of the infected glands, the mortality in La Guaira was reduced to 16.66% in 1908.[15]

[12] Chacín Itriago, L. G., y Bello, Carlos J.: "Clasificación de las ratas de Caracas," "Actas VIII Conf. San. Pan.," 1927, p. 260–63.

[13] Chacín Itriago, L. G.: "Clasificación de las pulgas que contienen las ratas de Caracas," "Actas VIII Conf. San. Pan.," 1927, pp. 264–266. He states that Dr. Francis M. Root of Johns Hopkins, then in Venezuela with a Rockefeller Foundation mission, aided in the classification.

[14] The rat-destruction and rat-proofing ordinances appear in "Actas VIII Conf. San. Pan.," 1927, pp. 258–69.

[15] Acosta Ortiz and Razetti, *supra* (IV Conf.), p. 202.