PLAGUE IN THE AMERICAS: AN HISTORICAL AND QUASI-EPIDEMIOLOGICAL SURVEY*

(Continued)

III. BOLIVIA

Bolivia, which, undoubtedly because of its isolated, land-locked situation, was the last of the American countries to be invaded by plague (See General Review), lies in the heart of South America. It extends from the tropical Amazon and La Plata drainage basins in the north, east and south, to the two Andean ranges in the west with their great central plateau, 13,000 feet high. Most of the larger cities are in this Andean area. The territory so far invaded by plague lies east of the Cordillera, in the Andean foothills, and includes part of the Departments of Tarija, Chuquisaca, and Santa Cruz. From the foothills in which their capitals are located (Tarija, 3,600 feet; Sucre, Chuquisaca, 9,186 feet; and Santa Cruz, 1,300 feet), these Departments descend into the eastern *llanuras*, a large, unexplored area, rich in vegetation and inhabited mostly by Indians. It is drained in the north by the Río Grande, a tributary of the Mamoré, of the Amazon system; and in the south by the Pilcomayo river, which flows into the Paraguay and eventually into the Plata. The Department of Tarija borders on Argentina and the Chaco; those of Santa Cruz and Chuquisaca on Brazil. The climate ranges from mild to hot; the air is dry, except in certain limited areas. November to March is the rainy season in the Vallegrande area of Santa Cruz. The crops raised vary with the altitude—wheat, tobacco, sugar cane, coffee, and cacao. Stock-raising is also common. The plague region is broken, hilly, generally wooded. Communication is mainly by mule or horse-back over narrow trails; dwellings are far apart, and the population is small; in the Vallegrande area, for instance, it is estimated at 2.55 inhabitants per km.[2] (Less than 1 per square mile.) Houses are of flimsy construction, of poles or adobe, with thatched roofs. The population of the foothill region is largely white or mestizo, and Spanish-speaking. Among prevalent diseases other than plague may be mentioned malaria, intestinal parasites, goiter, and some leprosy.[1, 2]

A number of interesting features have characterized the course of plague in Bolivia. Apparently *rats* played no part in the earlier epidemics (Tarija, 1921–22; Vallegrande, Santa Cruz, 1928, 1935; and Tomina, Chuquisaca, 1933, 1935),[3] but in those of Entre Ríos (Tarija), 1938, and Choreti and Camiri (Santa Cruz), 1938, epizootics among rats were observed, and it was reported that these and other towns which had previously been rat-free became overrun with the animals after extensive movements of troops and supplies in the course of military

* See General Review.

[1] Sotelo, L. V.: Lepra, paludismo y peste bubónica, "Trabajos, Primer Cong. Méd. Boliviano," Sucre, 1931, 12 pp.

[2] Mendoza, J.: Notas sobre geografía médica boliviana, in "Apuntes de un médico," Sucre, 1936, p. 33.

[3] Veintemillas, F.: "La peste bubónica en Bolivia," La Paz, Dec., 1936, 193 pp. (This volume is a compilation of the author's previous reports and articles on plague, together with official documents and a summary of articles by other authors. The first report is that on the Vallegrande outbreak, published in 1928.)

operations.[4] Various types of *wild rodents* existed in the earlier (and later) plague areas, but their rôle in plague has not been definitely determined.[5] However, in June, 1938, a dead plague-infected rabbit (*Sylvilagus*) was found at Ipaguazi, Department of Tarija, during an Argentine-Bolivian epidemic, and an epizootic among *cuises*, rabbits and brush rats (*ratas del monte*) was observed.[6]

Man-flea transmission.—Man himself is believed to have played the principal part in the transmission of Bolivian plague. The universal custom of holding wakes over the dead results in the crowding into the single room of a dark, dirty hut of dozens of friends and relatives who eat, drink, make music, and play cards (the loser being obliged to pray for the soul of the departed) for a day or more. Then the corpse is buried, the belongings, consisting mainly of blankets and clothing, are divided, and the visitors scatter to their isolated homes. Huts and inhabitants alike are usually infested with fleas and *vinchucas* (a kind of winged bedbug).[7] If the deceased was a plague victim, new cases appear in widely separated localities in from five to six days after the gathering.[3] This type of contagion has been observed in several epidemics, including the original one in Tarija.[8]

History.—The history of plague in Bolivia is largely the work of one man: Félix Veintemillas, head of the National Institute of Bacteriology. His was the first official diagnosis of the disease (in the Vallegrande epidemic of 1928), and after a long struggle, during which his argument was reinforced by further outbreaks of plague, he succeeded in having his views accepted. He emphasized in his description of the Vallegrande outbreak the lack of rats, and the probability of man-to-man transmission, possibly by the flea. He has been the head of the plague commissions sent to investigate and combat epidemics, and a number of later papers on Bolivian plague are the work of men who served with him as students or interns.

And on a visit to the Chaco, Veintemillas secured information con-

[4] Veintemillas, F.: "Sobre la peste en Bolivia," Suplemento, Inst. Nac. Bact., Mar. 1940, p. 68.

[5] In all the Bolivian plague area, there are *cávidos* (*caviae*, "burrowers") and *graomys* which live in hollow trees, birds' nests, woodpecker and parrot holes, fallen trunks, and piles of dry branches. They enter houses and nest in underground burrows or in the straw roofs, and live together with domestic rats where such exist. (Ossio, D.: *Bol. Min. Hig. & Sal.*, Dec. 1938, p. 11.) Veintemillas has reported the presence in the areas in which he worked of *ratones* (mice), wild grey *cuises* (*pampa huancos*), *viscachas* (*vizcachas*), *quirquinchos* (armadillos), *tatus*, the *achocalla* (wild field rat), and birds of prey. ("La peste en Bolivia," 1936, pp. 7, 176.) In Argentina the *peludo* (*Chaetophractus villosus*), a species of armadillo, has been found completely resistant to plague. (Uriarte, L., and Morales, V., N.: *Rev. Inst. Bact.*, Arg., Jul. 1936, p. 720.) *Graomys*, *vizcachas* (*Lagostomus*), and various types of *cuises* and other rodents have been found very sensitive to plague in Argentina. (*Ibid.* See also General Review and Argentina.)

[6] Alvarado, C. A.: Report to the Comisión de Asesoramiento Técnico de la Peste, *Bol. Sanitario*, Arg., May 1939, p. 405.

[7] Plague-infected fleas have been found on ponchos in Peru. (Ramos Díaz, A.: *Bol. Of. San. Pan.*, Sept. 1938, p. 779.) Veintemillas found plague bacilli in the stomach contents of *vinchucas* in Vallegrande, 1928. ("La peste, etc.," 1936, p. 24.)

[8] Letter of Deterlino Caso, Mar. 30, 1938, to Luis Mealla C., quoted in the latter's "Epidemia de peste en Entre Ríos," Universidad de San Andrés, 1938, p. 27. Caso was on the scene from Apr. 1921 on, sent by the Prefecture of Tarija.

cerning the earliest known epidemic in Bolivia—that in the Province of Arce, Department of Tarija, on the Argentine frontier, in 1921 and 1922.[9]

Tarija.—Caso[8] attributed the introduction of plague into Bolivia to a woman who returned from Estación Perico del Carmen, Jujuy, Argentina (railway station which had plague in 1919 and other years) to the vicinity of Padcaya, Bolivia, in January, 1921. She died January 20 in Pabellón (or Cañas), and her wake lasted four days, inasmuch as she was a woman of property and the supply of food was plentiful.[10] Six days after the burial the relatives reunited in her house to divide her effects, including a bundle of clothing which she had brought from Argentina. Most of them soon became seriously ill, with delirium, severe headache, pain in the axillae and groin, and bubos. In Taco-Taco, from which most of the guests had come, 80 out of the 158 inhabitants became ill. Cases appeared in Cruz Grande, La Lagunita, and Guayavillas among other visitors. The epidemic lasted from January 20 to July 31. A total of 1,525 cases was reported (642 deaths and 883 recoveries). Control work included the burning of houses and belongings of the dead, and the establishment of a sanitary cordon around Taco-Taco.

Baldivieso[9] described an epidemic in the same vicinity lasting from December, 1921, to May, 1922, and believed to have originated in a woman who came to Cebolla-huaico, Bolivia, from Güemes, Argentina (a railway station where a Bolivian physician, among others, had died of plague). There were cases in Lagunita, Cruz Grande, Rumicancha, Carrillos, Guayavillas, Campanario, Totora, Taco-Taco, Cañas, and San Francisco. No domestic rats were seen, although *Mus muris* was found. There were 300 deaths, 87 of them pneumonic. Since the mortality was said to be about 80 percent, there were around 375 cases. Vaccination and sanitary cordons were resorted to. One vaccinated member of the sanitary commission died. Finally, houses were burned and the epidemic ended; most of the inhabitants had fled.

Vallegrande. Plague without rats.—The first outbreak of plague in Bolivia to be confirmed by bacteriological examination was that in June–July, 1928, in the Province of Vallegrande, Department of Santa Cruz.[11] The capital city, Vallegrande, with a population of 4,000, lies at about 6,500 feet altitude and has an average temperature of 62 F. There was plague all around, but not in, the city. In two months there

[9] Communication from Dr. A. Baldivieso, Feb. 22, 1933, quoted by Veintemillas in "La peste, etc.," 1936, pp. 144, 190. (Plague had been reported in northern Jujuy and Salta, Arg., as early as 1913. Dr. José F. Montellano, a Bolivian physician living in Buenos Aires, was apparently the first to warn of the danger of plague invading Bolivia, after an epidemic in Jujuy in 1920.) Baldivieso was present at the focus from January on, representing the departmental health authority.

[10] Two large oxen, 12 lambs, chickens and ducks were killed, and two measures of corn husked for *mote* (stew) and *tamales*, in preparation for the wake. About 30 relatives and neighbors attended.

[11] That the local sub-prefect, a layman, suspected the true nature of the disease is seen by his telegram, in which, in addition to describing the symptoms of the infection, he requested information on the availability of "antibubonic serum." (Telegram of U. Franco, quoted by Veintemillas, "La peste, etc.," 1936, p. 42).

were 88 deaths and approximately 300 cases of plague in Guariconga, Mataral, Higuera, Palmar, Chapas, Chapitas, Barbecos, Cormelona, Peñón, Tierras Nuevas, Angostura and Guadalupe, total population about 1,000. The origin of the epidemic is uncertain; the first known case was in a native of Palmitas who went to Mosquera in May to harvest rice; three weeks later he returned and died at Guariconga on his way home. Veintemillas feels that the original infection may have been imported by persons coming from Argentina, Brazil or Paraguay, or by rats coming in over the roads opened by the petroleum companies;[12] and that the subsequent transmission was by personal human contact, or by fleas, or possibly by *vinchucas*. He found plague bacilli in the stomach contents of the latter insects.[13] No rats could be found, although *conejillos*[14] and a wild rodent "with a tail," called an *achocallo* or *tujo*, which lived underground, were reported in the vicinity. Bubonic, septicemic (with 100 percent mortality), and meningeal-septicemic cases were observed. The Commission[12] saw no respiratory or intestinal plague, although the inhabitants reported both. Cutaneous forms with anthrax-like abcesses in regions distant from the glands were seen;[15] their evolution was relatively mild. The precautionary measures taken included vaccination (8,548 vaccinations including some re-vaccinations), establishment of sanitary cordons, halting of traffic, and disinfection of mail. While cases could not be isolated in a hospital, it was felt that some measure of isolation was achieved by quarantining the infected hut or huts, usually several kilometers from the next habitation.

Although cultures from cases were identified as plague both by Bolivian and foreign bacteriologists, the diagnosis of plague in this epidemic was not accepted for several years.

Plague-like epidemics were reported in Vallegrande Province in 1929 in Filo, 40 km from Postrervalle; in 1930 in Mataral; in November, 1933 in Mosquerilla and Postrervalle, and in 1934 in Postrervalle, but no official study was made.[16] In July, 1935, plague appeared in the Postrervalle area in Llorente, El Chorro, Recodo, Villcas, and Huayracasa. There were 12 cases, 9 deaths (75 percent mortality) in July in Llorente and El Chorro. Two of the cases were septicemic, the rest bubonic.[17]

[12] Veintemillas, F.: "La peste, etc.", 1936, pp. 20, 140. This Commission included Drs. Veintemillas, A. Peña and Luis Sotelo, and interns J. R. Torrico and R. Galindo. A sixth member was forced to remain behind for personal reasons.

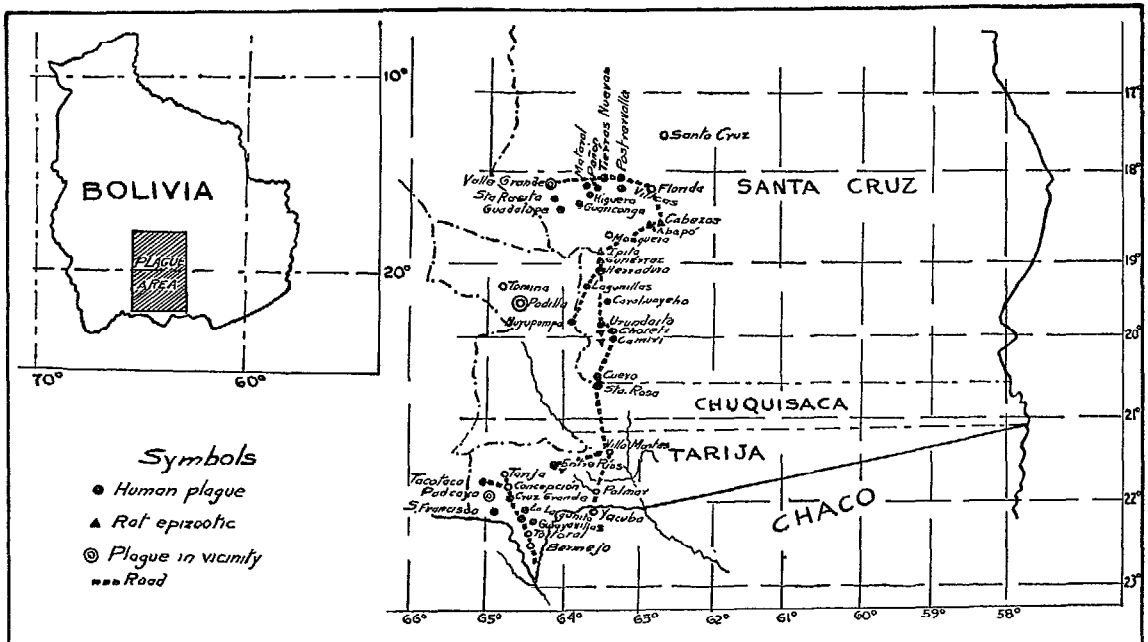
[13] See Note 7.

[14] "Little rabbit," or possibly a guinea pig.

[15] It may be noted that some lay observers (pharmacist, lawyer) considered that some cases were anthrax due to infected beef. The inhabitants were accustomed to buy stock poisoned by weeds which were harmless to man, and had purchased some anthrax-killed beef. (Veintemillas: "La peste, etc.", 1936, pp. 95 and 96.)

[16] Sánchez Peña, F.: Estudios e informes, Santa Cruz de la Sierra, Bolivia, 1935, p. 47; Veintemillas: "La peste, etc.", 1936, pp. 169, 175.

[17] Veintemillas: *Ibid.*, p. 175.



MAP SHOWING PLAGUE PREVALENCE IN BOLIVIA

NOTE: The plague-infected localities are all small villages, most of them with only a few hundred inhabitants.

Tomina. Plague without rats.—The third plague focus to be observed in Bolivia was the Province of Tomina, Department of Chuquisaca, where the disease was first reported in January, 1933, in the vicinity of Padilla. The characteristics of the area—mountain land broken by ravines and gorges, considerable vegetation, subtropical climate, race (largely white) and customs of the inhabitants, even the prevalence of goiter—were the same as in Vallegrande, and it was suggested that the infection came from that Province. The first known case was in Huairahuasi Grande where 19 out of the 22 inhabitants died. The remaining three fled, bearing the contagion, and new infections appeared in Montecanto, El Cerro, El Rosal, Huairahuasi Chico, La Belleza, Naranjos, Huairackasa, and other points. There was apparently no rat intervention. Sanitary cordons and vaccination were used to combat the epidemic. Serum treatment was practically impossible, due to the fact that the cases were widely separated and required too long to reach. About 800 persons died.[18]

In June, 1933, another outbreak occurred in the Padilla area, many of the cases among persons who had been vaccinated during the previous epidemic (January and February).[19] Over 105 deaths were reported, in Lorito Kacka, Yana Curo, Barba-cua, Cebadal, Cillar Pampa, Real Pampa (80 deaths out of the 120 inhabitants), and Kana-Curuco. There was apparently no official confirmation of this epidemic. Although rats were present in the town of Padilla there was no plague among its 2000 inhabitants.[20]

Plague continued to appear in Tomina, and one writer has stated that it is present every year from December to February.[21] From October, 1934 to February, 1935 there were cases in the El Rosal area[22] (El Potrero, Yanacurco, Khara Estancia, Huayrahuasi Grande, Huayrahuasi Chico, Tola Orcko, Montecanto, Contadero, and San Julián), near a military highway. Clinical forms of the disease ranged from severe, fatal bubonic and pneumonic forms to walking bubonic cases. There were two septicemic cases, one mild, the other severe, and one cutaneous case with anthrax-like nodules in the left crest of the ilium. A few *Mus muris* were found and examined. There were no gross signs of plague; cultures showed a *pasteurella*—like that found in Villa Montes rats (see below).[23] No domestic rats were found. In June, 1935, plague had extended to the Cantón Villa Serrano, sites of Rodeos, Ovejeros, La Ciénaga, Arrayán and Pampas del Tigre, making a total

[18] *Ibid.*, p. 123.

[19] Veintemillas pointed out that vaccination is not supposed to protect over three to five months and that, in any case, it is regarded as only about 70% effective.

[20] Fatal tumors in cattle and sheep were reported during the epidemic. (See Note 15.) Veintemillas, F.: "La peste, etc.", 1936, p. 136.

[21] Benavides Borja, quoted by Mealla, *op. cit.*, p. 41.

[22] Veintemillas: "La peste, etc.", 1936, p. 140.

[23] Granados García, M.: "Nueva epidemia de peste en Tomina," etc., quoted by Veintemillas in "La peste, etc.", 1936, p. 158.

plague area of 150 km.[2] In January and February 1937 plague was again reported from Tomina Province,[24] and in 1938, there were 56 cases, 22 deaths.

Rat-borne plague.—In 1932 an epidemic in Argentina aroused fears of an invasion of plague into the Chaco, and a study was made in the Chaco area. No plague was found, but a large rat population was observed in Villa Montes and other points. Veintemillas examined 50 rats from San Francisco and San Antonio (*R. norvegicus*), and found that 50% suffered from a suspicious disease. Inoculation caused a fatal infection in guinea-pigs, and a plague-like *pasteurella* was recovered which, however, was not considered identical with that of plague. It was noted that the rats had few parasites.[25] Toward the end of the Chaco war, troops and materials were transferred to the Chuquisaca-Santa Cruz frontier, from Villa Montes, and rats were transferred with them. House rats became prevalent in Tarija, Chuquisaca, and Santa Cruz, which formerly had none. And in January, 1938, classic rat-borne plague appeared in Entre Ríos, Department of Tarija.[26] The origin of the epidemic was not known, although the possibility of spread from possibly infected wild rodents was mentioned.[27] Plague was preceded by a murine epizootic for the first time in Bolivia. Smears from spleens of dead rats, and cultures, revealed *B. pestis*.[26] All types of plague were observed, from fatal pneumonic and septicemic (5 each) to ambulatory. Treatment included tonics, stimulants, lancing of bubos, serum, and tartar emetic.[28] There were 90 cases, 18 deaths.

Rat-borne plague also appeared in 1938 in the Department of Santa Cruz. On August 28, 1938, a soldier died of possible pneumonic plague in the military hospital at Santa Cruz. He had come from the First Army Corps quarters at Camiri and Choreti, where troops were being demobilized, and was on his way home. At about the same time rat epizootics were observed in Abapó and Cabezas (on the right bank of the Río Grande, some 26 leagues from Santa Cruz), and also in the old, insanitary towns of Ipita and Gutiérrez, the latter 75 and 65 km respectively from Camiri. A rat epizootic also occurred in Río Negro. Choreti (500 inhabitants) was finally burned, the householders being compensated for their losses. From September 11, when the Plague Commission arrived, to October 29, there were 141 cases, 54 deaths in the Choreti-Camiri area (Choreti, 86 cases; Camiri, 53; Herradura 1; Urundaiti, 1) to which may be added at least 9 cases, 8 deaths occurring previously, making a total of 150 cases, 62 deaths. There was also a case in Lagunillas the outcome of which was unknown. The epidemic was preceded by a rat epizootic in the two localities in the last part of July and first of August. Of the cases during the stay of the Commission, 65 cases and 19 deaths were in soldiers. There were 9 cases of septicemic plague with 7 deaths; 3 cases of pneumonic, all fatal. Two cases, 1 death, occurred in Muyupampa (probably included with either Choreti or Camiri cases), one of which

[24] Veintemillas: *Ibid.*, p. 193.
[25] *Ibid.*, p. 121.
[26] Mealla, *op. cit.*, p. 32.
[27] Veintemillas, F.: *Sup. Inst. Nac. Bact.*, Mar. 1940, p. 75.
[28] *Ibid.*

was traced to an army supply store which imported goods from Choreti. The mortality has been reported at from 37 to 60% at various periods, with an average of 45% according to the figures given. Treatment included serum and tartar emetic.[29] Rat destruction by use of a method of fumigating burrows was reported very successful.[30] It may be noted that in 1939 a commission reported plague infection in 15% of the rats examined in a plague region.[31]

Plague control.—The control of plague in Bolivia offers a number of difficulties. The poor living conditions and lack of education of the inhabitants of the area; the wooded, broken nature of the country, which makes the evasion of quarantines and sanitary cordons by contacts very easy; the lack of hospital facilities; and the probability that plague now exists among wild rodents, are all obstacles in the way of a systematic program. In the past, as has been indicated, control work has consisted of sending a plague commission after an epidemic has broken out. The commission vaccinated all persons it could lay hands on, established sanitary cordons around infected areas, and often ended by burning infected dwellings or a whole town (Choreti). If rats were present, poisoning was also carried on.

In 1938 plans were drawn for a permanent plague control campaign, under the direction of the Ministry of Hygiene and Public Health,[32] working through a Central Committee composed of the National Director of Epidemiology, the Inspector General of Army Health, and the Chief of Information and Propaganda of the Ministry of Hygiene. The Committee is to study local and foreign plague epidemiology, control and statistics and direct the work done in the plague Zone Headquarters and by the Brigades. Zone chiefs are authorized to declare quarantines and establish sanitary cordons, with the cooperation if necessary of the Army and Police, and may use military hospitals and infirmaries. Maps by districts of plague areas are to be made, each district to include 100 to 150 houses, and the maps to show the location, construction and purpose of dwellings, sanitary condition and means of communication. Educational work is to be carried on with the cooperation of parish priests, teachers and Army officers. Each headquarters will have a bacteriologist for diagnostic and experimental work. The plague control brigades will carry out a program of vaccination, inspection, deratization, deinsectization and education. Diagrams will be made showing the placing of poison; traps are to be distributed, and

[29] Ossio, D.: *Bol. Min. Hig. & Sal.*, Dec. 1938, p. 8; Prado Barrientos, L.: *Ibid.*, p. 13. Bolivian plague workers do not seem to have relied on serum treatment to the same extent as those in most other countries. One reason has been, as noted above, the difficulty in reaching patients with it. In the latest epidemic, severe reactions were noted with one stock of serum, and it was abandoned for tartar emetic injections. Another stock of serum, however, gave excellent results.

[30] "Guillotin." The product is a combination of sulfur, potassium chlorate, nitrate potash, arsenic, and saw dust, is inflammable, and releases an asphyxiating gas said to be fatal to insects and rodents and harmless to man and domestic animals. Ossio, *op. cit.*

[31] *Bol. Min. Hig. & Sal.*, 1-2 trim. 1939, p. 103. Locality not stated.

[32] *Bol. Min. Hig. & Sal.*, Dec. 1938, p. 27.

PLAGUE IN BOLIVIA[35]

Reference	Locality	Date	Cases	Deaths	Mortality	Remarks
(A) Without Rats						
Caso	Tarija	Jan.–Jul. 1921	1,525	642	42%	
Baldivieso	Tarija	Dec. '21–May '22	375	300	80%	87 pneumonic deaths
Veintemillas	Vallegrande	June–Jul. 1928	300	88	29%	Some septicemic, respiratory, and cutaneous
"	" (Filo)	1929	?	?		
"	" (Mataral)	1930	?	?		
"	" (Mosquerilla and Postrervalle)	Nov. 1933	?	?		
"	Vallegrande (Postrervalle)	1934	?	?		
"	" "	Jul. 1935	12	9	75%	2 septicemic, rest bubonic
"	Tomina (Padilla)	Jan. 1933	?	800		
"	" "	June 1933	?	105		
"	" "	Oct. '34–Feb. '35	?	?		Some pneumonic and septicemic
"	"	June 1935	?	?		
"	"	Jan.–Feb. 1937	?	?		
"	"	1938	56	22	39%	
(B) With Rats						
Mealla	Tarija (Entre Ríos)	Jan. 1938	90	18	18%	90 "sick." Possibly 108 cases altogether. 5 pneumonic, 5 septicemic, all fatal
Prado B.	Santa Cruz (Choreti-Camiri)	Aug.–Oct. 1938	150	62	45%	9 C, 7 D septicemic; 3 C, 3 D pneumonic
"	" (Lagunillas)	Aug.–Oct. 1938	1	?		
Total, 1921–1938			3,414	2,046		

[35] The lack of routine bacteriological confirmation of cases makes for considerable uncertainty in plague reports. For instance, 30 cases reported as plague in the period Oct. 1-Dec. 31, 1939, were later declared to be "pneumonic influenza" and not plague. (Report from the Director General of Public Health of Bolivia. See *Comunicado Semanal* (Weekly Report) of the Pan American Sanitary Bureau, Nos. 7 (Feb. 12, 1940) and 14 (Apr. 1.).)

captured rats examined and classified. The brigades will be equipped with trucks, or in mountainous country, use horses and mules. According to the scheduled plan there will be Zone headquarters in the El Rosal area and Choreti, the first with two brigades, the second with four. There would be two chief medical officers, six physicians (heading the brigades), two bacteriologists, and other personnel, including soldiers. While the enabling legislation was passed and the plan put into operation in 1939,[33] it has been reported that the program had to be curtailed for financial reasons, and just how much of the plan is actually being carried out is not known. Periodic vaccination is undertaken, using vaccine made by the National Institute of Bacteriology from local strains. Reduction of rats in some areas after intensive work has been reported.

The legal provisions pertaining to plague control include: Resolución Suprema of October 19, 1938, giving the Ministry of Hygiene and Public Health exclusive power to intervene in plague matters; and specifying salaries and accident compensation for physicians and personnel; and Decreto Supremo of January 10, 1939, containing antiplague regulations.[34]

[33] *Bol. Min. Hig. & Sal.*, 1-2 trim. 1939, p. 101.
[34] *Bol. Min. Hig. & Sal.*, Dec. 1938, p. 33; 1-2 trim. 1939, p. 144.

(*To be continued*)