

Yellow Fever in Eastern Bolivia and the hygienic preventive measures adopted in Northern Argentina ¹

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I

In March and April of 1932 the serious news circulated that a new continental focus of yellow fever had been located at Santa Cruz de la Sierra * a town in Bolivia of about 23.000 inhabitants, situated in the vicinity of the River Piray (a tributary of the Mamore) at 440 metres above sea-level and at a distance of 575 kilometres from the Argentine Bolivian frontier, with a temperature of 24°C; a place enjoying only an indirect, very distant and seldom-used river communication with the districts of North-Eastern Brasil, where yellow fever is endemic.

Three different commissions (one Bolivian and two Argentine) were sent in succession in order to establish the indispensable diagnosis with certainty. Although none of the three commissions could establish it in the epidemic centre itself, nevertheless, they were able to obtain the human material with which it was possible to confirm such an unexpected item of news later on.

The verification of the existence of yellow fever in Eastern Bolivia was effected chronologically as follows:

1° Histopathological diagnosis of yellow fever, carried out on April 30, 1932 at the Oswaldo Cruz Institute, Rio de Janeiro, by Doctors OSWINDO PENNA, BURLE DE FIGUEIREDO and MAGARINOS TORRES, with material (liver of the patient Peralta deceased) sent by Dr. PRADO BARRIENTOS, member of the first sanitary commission (Bolivian). This diagnosis was not known in Bolivia until after May 10, 1932.

2° Positive serological diagnosis (see table on page 112), by proving the protective power of 5 human serums of convalescent soldiers, effected on

¹ The mistakes, the fundamental geographical errors and the constant neglect of mentioning the work that is being carried out on this matter by the Instituto Bacteriológico, amply justify these retrospective notes.

* Due to an error, Professor MARCHOUX (Pasteur Institute, Paris) places the Department of Santa Cruz de la Sierra in the Argentine Republic, while it is really situated in Bolivia. See *Bulletin de la Societe de Pathologie Exotique*, vol. XXV, page 682, lines 13 to 17. Paris, August 1932.

May 13 to 23, 1932, at the Yellow Fever Laboratory at Salvador (Baia-Brasil), by Dr. HENRIQUE PENNA DE AZEVEDO; with material sent by Prof. MAZZA² (of the University of Buenos Aires) who constituted the second commission (Argentine). This diagnosis was anticipated telegraphically on May 20, 1932.

3^o Histopathological diagnosis of three cases of yellow fever which occurred in the same week, carried out on May 24, 1932, at the Instituto Bacteriológico Dep. Nac. de Higiene, Bs. As. by J. A. Zuccarini with material obtained by him in person at Santa Cruz de la Sierra, after the apparent disappearance of the epidemic focus. Señor ZUCCARINI effected this as member of the third commission (Argentina)³.

II

The Dep. Nac. de Higiene having proved the existence of yellow fever in Eastern Bolivia by means of its own investigations. The President of that Institution, Dr. MIGUEL SUSSINI, foreseeing the possibility of the introduction of yellow fever in the Argentine Republic, acting on the proposal of Dr. ALFREDO SORDELLI, resolved to have an entomological study carried out in Northern Argentina, with the main object of it serving as an epidemiological basis for preventive hygienic measures.

This study was carried out in accordance with the plan drawn up by the Direction of the Instituto Bacteriológico, the principal points of which being as follows:

1^o To determine the places of human traffic between Bolivia and Argentina, specially in the pre-Cordilleran zone, in order to carry out the epidemiological study.

2^o To point out in these localities, the place, importance and dispersion of human traffic; draw a plan of existing buildings giving each house a number; take a census of inhabitants and another of foci of larvae, the nature of breeding grounds, using the nomenclature and classification employed in Buenos Aires 1928-1929; the present state of *Aedes aegypti* (presence of adults, larvae, etc.) rural foci, breeding-grounds at a distance from the residential quarters⁴. This study was carried out by EDUARDO DEL PONTE and MARCOS A. RIESEL (Entomology Section of the Instituto Bacteriológico) between July 6 and September 21, 1932. The plan mentioned above was carried out in the following localities: Aguaray, Tartagal, Vespucio (Salta); Formosa, Las Lomitas, Ing. Juarez, and Puerto Irigoyen (Territory of Formosa). In spite of it being winter the *Aedes* index was very high, as can be seen in the chart on page 115.

² Prof. MAZZA was at Santa Cruz from the 24th to the 29th of April, 1932, but was not able to observe any patients. (*Loc. cit.* note 3 on page 112).

³ The third commission was sent by the Dep. Nac. de Higiene - Argentina and consisted of Prof. JUAN CARLOS ALONSO MUJICA and JUAN A. ZUCCARINI (I. B.), who were stationed at Santa Cruz from the 1st to the 10th of May, 1932. During this period, the epidemic did not appear to exist in the city, in spite of very propitious ecological conditions.

Nevertheless, there were already in the local hospital San Juan de Dios, one patient in a serious condition and later on four more with high fever. They all came from districts situated to the west of Santa Cruz, in which high temperature, vomiting, jaundice haemorrhagiae, casts in large numbers and intense albuminuria were observed.

Of the 5 patients, 4 died. An autopsy (with the assistance of Dr. JULIO ARCIENAGA, a Bolivian Army surgeon) was carried out on three of the bodies. The following changes were noted in the autopsy: jaundice, haemorrhages in the mucosa of the alimentary canal, fatty and cloudy degeneration of the liver.

⁴ See work mentioned in note 6 on page 114.

With such results, the Departamento Nacional de Higiene initiated the policy of larvarial foci in Northern Argentina, and for this purpose founded four sanitary stations ad hoc on the Bolivian frontier, in charge of Dr. CARLOS ALBERTO ALVARADO. At first, he was advised in his functions by EDUARDO DEL PONTE, who pointed out the methods to be used in carrying on further investigations.

III

The positive diagnostics formulated by the Oswaldo Cruz Institute, the Yellow Fever Laboratory of the Rockefeller Foundation at Salvador (Baia-Brasil) and by the Instituto Bacteriológico del Dep. Nac. de Higiene in Buenos Aires, proved to be the basis by means of which Bolivia began to fight yellow fever. With this object, the Bolivian Government signed a contract with the Rockefeller Foundation and the latter has organized the sanitary services, placing them in the capable hands of Dr. WALCOTT, a North-American specialist. According to recent data — the beginning of the spring 1932 — yellow fever has made no headway in Bolivia, which greatly diminishes the possibility of its introduction into our country.

In the Argentine Republic, the yellow fever service of the Departamento Nacional de Higiene has not registered up to date a single suspicious case.

The three cases of yellow fever, denounced by Professor Mazza in September of last year to the political authorities of the province of Salta, which occurred in San Martín del Tabacal, were found to be a false alarm. This was proved by the technical staff of the Oswaldo Cruz Institute and the Yellow Fever Laboratory by means of the study of the same microscopical preparations that Prof. Mazza had used when formulating the mentioned diagnosis. This verification was corroborated by the clinical and epidemiological study carried out by Dr. ALVARADO, who came to the conclusion they were cases of hemorrhagic smallpox.