

A Survey to Assess Potential Human Disease Hazards Along Proposed Sea Level Canal Routes in Panamá and Colombia.

I. Introduction

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MAN began considering construction of a sea level canal somewhere in Central America at a very early time. Balboa visualized such a thing in 1513 and a Scot trading company which became established on the Atlantic coast of the Darién area of Panamá in 1699 also planned for one. In 1870, the US Navy was commissioned to conduct a survey for a sea level canal in the Darién region. When the French started construction of the present Panama Canal, they too had a sea level canal in mind. Again, when the United States took over construction from the bankrupt French company, it was intended that a sea level canal would be constructed. However, economics and limitations of the technology of the time resulted in a lock-type canal being built.

One of the main factors that caused the French company to fail was the delay in construction resulting from disease among the workers. When the United States took over, medical studies and investigations were conducted to determine the nature of the problem and how it could be handled so that work could continue. History has recorded the outstanding success that Colonel Gorgas achieved in ridding the area of disease, so that full-scale work could be resumed and the canal completed.

In 1964, under Public Law 88-609, Congress authorized a study to be made to assess the feasibility of constructing a sea level canal in Central America. The sum of \$17.5 million and a three and one-half year time period for completion of the study were authorized. President Johnson appointed a commission of five prominent citizens to conduct the study. The Chief of Engineers, US Army, at the request of the commission became the engineering agent

and a field director's office was established in the Canal Zone.

The Surgeon General, US Army, aware of potential health hazards associated with such an undertaking, recommended their assessment. He emphasized the prior medical problems encountered in constructing the present Panama Canal. In addition, much experience had been gained concerning the occurrence and impact of disease upon such operations, as a result of military activities in various parts of the world during the World War II, the Korean War, and in Vietnam. To forestall a repetition of conditions such as those faced by Colonel Gorgas, information was needed concerning the diseases likely to be of importance in the proposed route areas.

A review of the literature revealed gaps in basic knowledge concerning the occurrence and ecology of disease in the vicinity of the proposed canal sites. A review of Colonel Gorgas' work revealed that malaria, yellow fever and dysentery were the main problems he had encountered. However, there was not sufficient detail recorded concerning numbers of cases, severity and duration of disease, effectiveness of therapy, preventive measures, etc., to be of direct application to present-day planning. The contractor who had surveyed the Inter-American Highway through the Darién Gap also made some interesting medical data available, though it was broad in nature and unrefined, making detailed evaluation difficult. As plans for engineering studies of the proposed sea level canal progressed, it became clear that medical feasibility studies were needed to determine: (1) what significant diseases were present in the indigenous human population; (2) what diseases transmissible to humans were present in vertebrate and invertebrate animals acting as potential reservoirs; (3) what potential modes of transmission existed between reservoirs and the human population; and (4) what vectors were involved and how they could be controlled or eliminated. From a medical viewpoint, it had to be determined whether adequate therapy and immunizations were available for certain diseases which might be encountered, considering that native populations would have to be moved during construction and a large labor force imported. Finally, ecological information

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