

*The Geological Society of America*  
*Memoir 36*

---

**GEOLOGY OF THE  
LAKE TITICACA REGION,  
PERU AND BOLIVIA**

BY  
NORMAN D. NEWELL  
American Museum of Natural History  
and  
Columbia University,  
New York, N. Y.



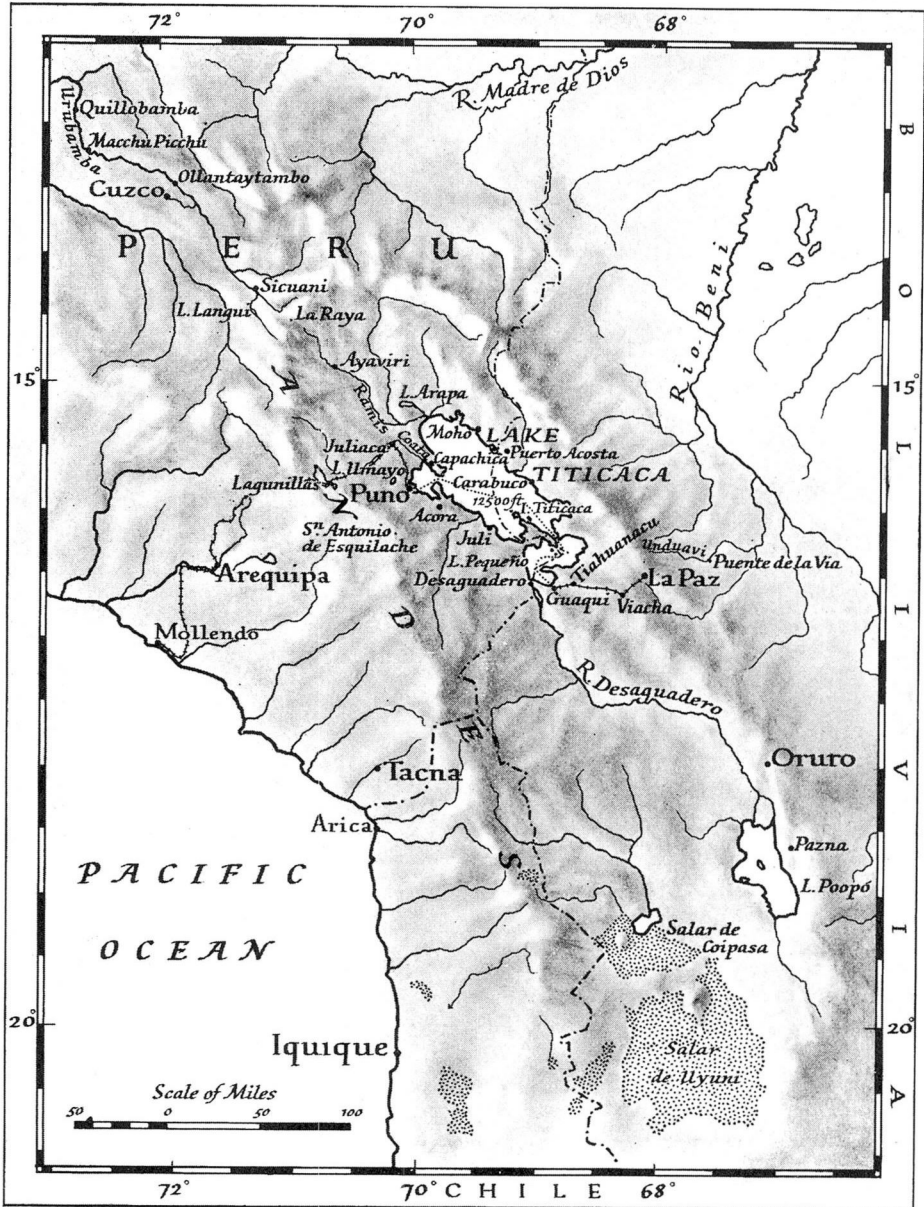
---

March 28, 1949

*Made in United States of America*

PRINTED BY WAVERLY PRESS, INC.  
BALTIMORE, MD.

PUBLISHED BY THE GEOLOGICAL SOCIETY OF AMERICA  
Address all communications to The Geological Society of America  
419 West 117 Street, New York 27, N. Y.



**LAKE TITICACA AND THE ANTIPLANO**  
 (Courtesy H. Cary Gilson and the Geographic Journal)

*The Memoir Series*  
of  
*The Geological Society of America*  
*is made possible*  
*through the bequest of*  
*Richard Alexander Fullerton Penrose, Jr.*



## ACKNOWLEDGMENTS

I shall always be grateful for the innumerable courtesies and relative freedom in my work granted me by the Director of the Cuerpo de Ingenieros de Minas, the late Ing. Luis F. Díaz, and Chief of the Petroleum Department, Ing. Augusto Cabrera La Rosa. This report is published with their authorization. Ing. S. L. Goldstein, erst-while Chief of the petroleum camp Pirín, was my good friend and counsellor throughout the work, and attended to many of my needs. Little would have been possible without his cooperation. I shall never forget the selfless devotion of my personal staff: Carlos Kalafatovich, Rex Smith, Augusto Elfas, and B. Valencia, who took turns travelling with me the ancient roads of the Incas. Many times we searched our way into the night seeking our sometimes elusive camp through driving rain or sleet. Particularly, I wish to pay respects to my friend, guide, and interpreter, a Quechua Indian, Honorato Gutiérrez, authentic son of Titicaca, who held my comfort and welfare above his own, and led me without harm through the land of his people. Dr. Jorge Broggi, Director of the Instituto Geológico, crusader for the geological sciences in a country poor in geologists, has from the beginning shown himself a true friend and has furthered my work in innumerable ways with the enthusiasm and unselfish spirit of a scientist. May his tireless efforts for Peruvian geology prosper!

Many of the drawings and maps for this report have been prepared by Mr. John Koenig. Financial aid in the preparation of illustrations was received from the special fund for research by the Graduate Faculties, Columbia University

