

REPORTS FROM THE SCIENTIFIC EXPEDITION TO THE NORTH-WESTERN  
PROVINCES OF CHINA UNDER THE LEADERSHIP OF DR. SVEN HEDIN  
— THE SINO-SWEDISH EXPEDITION —

Publication 6

## **II. Geodesy**

### **1**

# LATITUDE AND LONGITUDE DETERMINATIONS

IN

EASTERN TURKISTAN AND NORTHERN TIBET  
DERIVED FROM ASTRONOMICAL OBSERVATIONS

BY

NILS AMBOLT

WITH 74 ILLUSTRATIONS, IN THE TEXT, TWO  
MAPS AND ONE TABLE IN POCKET AT END

STOCKHOLM 1938

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BOKFÖRLAGS AKTIEBOLAGET THULE

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# INTRODUCTORY NOTE

**A**S a prospective member of the Scientific Staff of my Expedition to Central Asia and Tibet 1927—1933, a young scholar of the University of Lund, Mr. NILS AMBOLT, was specially recommended to me by such prominent men as Professor CHARLIER, Professor CARLHEIM-GYLLENSKIÖLD, and others. During a short visit to Europe in the early summer of 1928, I first met Mr. AMBOLT at the Geodetical Institute of Potsdam, where he was completing a study of gravity determinations under the leadership of Geheime Regierungsrat Dr. E. KOHLSCHÜTTER. Both at that time and during the course of the expedition, Dr. KOHLSCHÜTTER and his staff encouraged and assisted AMBOLT in every way. Since his return from the expedition, AMBOLT has also on many occasions had the privilege of benefiting by their advice and assistance on a number of questions, particularly as regards gravity determinations on which subject a special volume of this series will be published later. Both Mr. AMBOLT and myself regard it as our first duty to express our sincere gratitude to Dr. KOHLSCHÜTTER and his staff for their keen interest and help in connection with our investigations in Asia.

Accompanied by Mr. AMBOLT, I returned to Central Asia via Russia and Siberia. From Semipalatinsk we continued to Chuguchak, where AMBOLT became seriously ill and had to stay some time. His field work, therefore, could not begin until 1929, and even then he was handicapped by disease and sickness.

During his travels in Central Asia and Tibet, Mr. AMBOLT arranged his work as far as possible in intimate collaboration with the geological and topographical researches of Dr. ERIK NORIN. Even when they did not travel together, they still followed a common plan.

Furthermore, during the entire period of his travels, AMBOLT carried out detailed meteorological observations. In this work, he was assisted by a young Russian, Mr. P. K. VOROTNIKOV from Chuguchak, who, on earlier occasions, had served as assistant to our surgeon, Dr. DAVID HUMMEL, and our Chief Meteorologist, Dr. WALDEMAR HAUDE. It was due to the assistance of VOROTNIKOV that AMBOLT was able to carry out a barometrical nivellement along the road from Toqsun to Khotan.

On occasions when the work of the expedition was limited to a certain region, both NORIN and AMBOLT organized as far as possible a fixed observation base, where the meteorological elements were read hour by hour.

When NORIN and AMBOLT continued their travels to the high regions, VOROTNIKOV, by reason of weak health, was unable to accompany them and had to return to Yarkend. After his excellent service in connection with our Expedition, the young Russian was worthy of a better fate than that which befell him. He was unfortunately shot during the political disturbances in Eastern Turkistan which began in 1931—1932.

In the region north of Bogdo-ula, Mr. AMBOLT collaborated in the autumn of 1930 with Dr. P. L. YUAN, who, as member of our staff, contributed considerably to our scientific accomplishments. Dr. YUAN was also of very great assistance to the whole Expedition politically and diplomatically, and for this reason sacrificed much valuable time that otherwise would have been available for scientific research.

From personal experience of several crossings of Northern Tibet, I know what it means to take a caravan through the Chang-tang, south of the head ranges of the Kun-lun. Despite the hardships and difficulties which he had to encounter in this region, AMBOLT pressed forward uninterruptedly and carried out his research programme to completion. When crossing Northern Tibet, he explored hitherto absolutely unknown country and thus also made new conquests on behalf of geographical science.

In 1914, an Expedition under Dr. FILIPPO DE FILIPPI succeeded in determining the exact coordinates of a few of the westernmost places in Eastern Turkistan. To these, Mr. AMBOLT has added 160 points, of which no less than 98 longitudes have been determined by the aid of wireless time signals.

Stockholm, Sweden.  
January 15, 1938.

SVEN HEDIN.

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