

## 39. Sven Hedin's Mapping in Asia

By

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It is in my opinion no exaggeration to claim that to the participants in Sven Hedin's concluding great venture those happy Asian years of roving proved the culmen and the fulfilment of life. What had gone before were preparations, while the ensuing period perforce would mean laborious toil so as to make the results available to science.

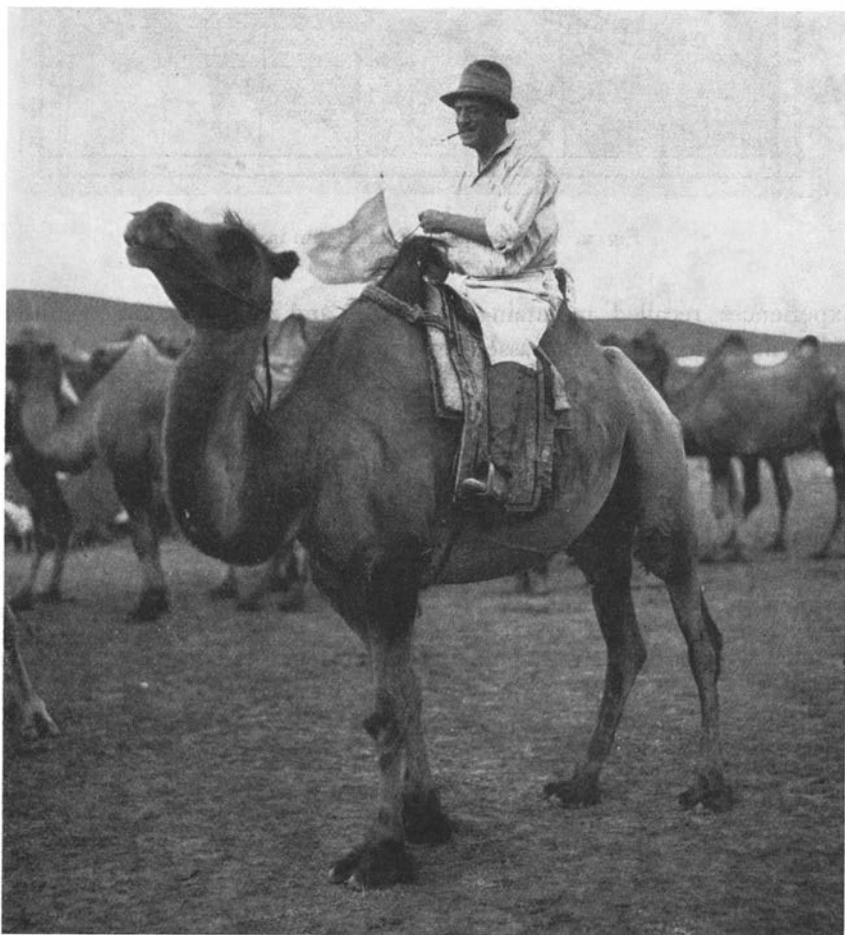


Fig. 1. Sven Hedin ready for start from Edsengol in 1927.

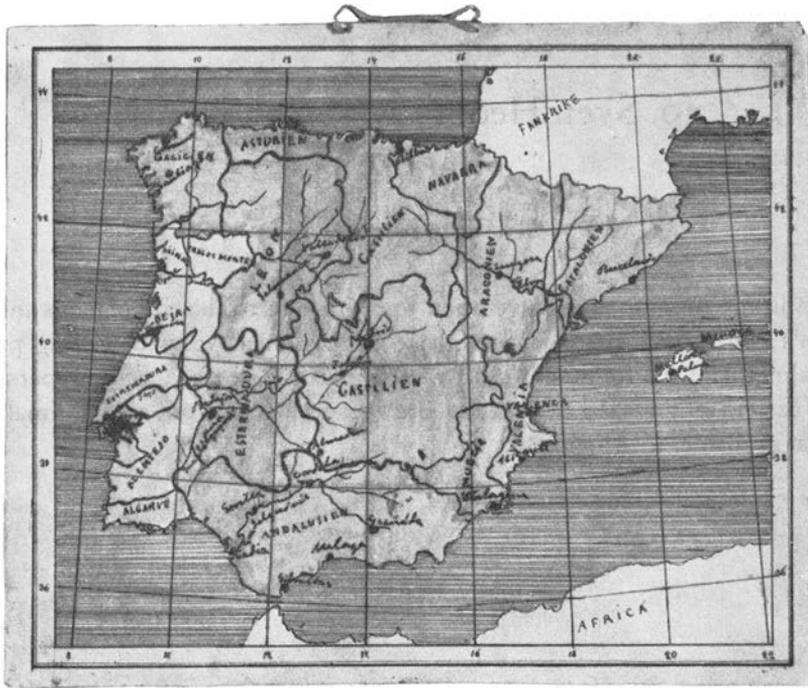


Fig. 2. Map drawn by Sven Hedin in 1878.

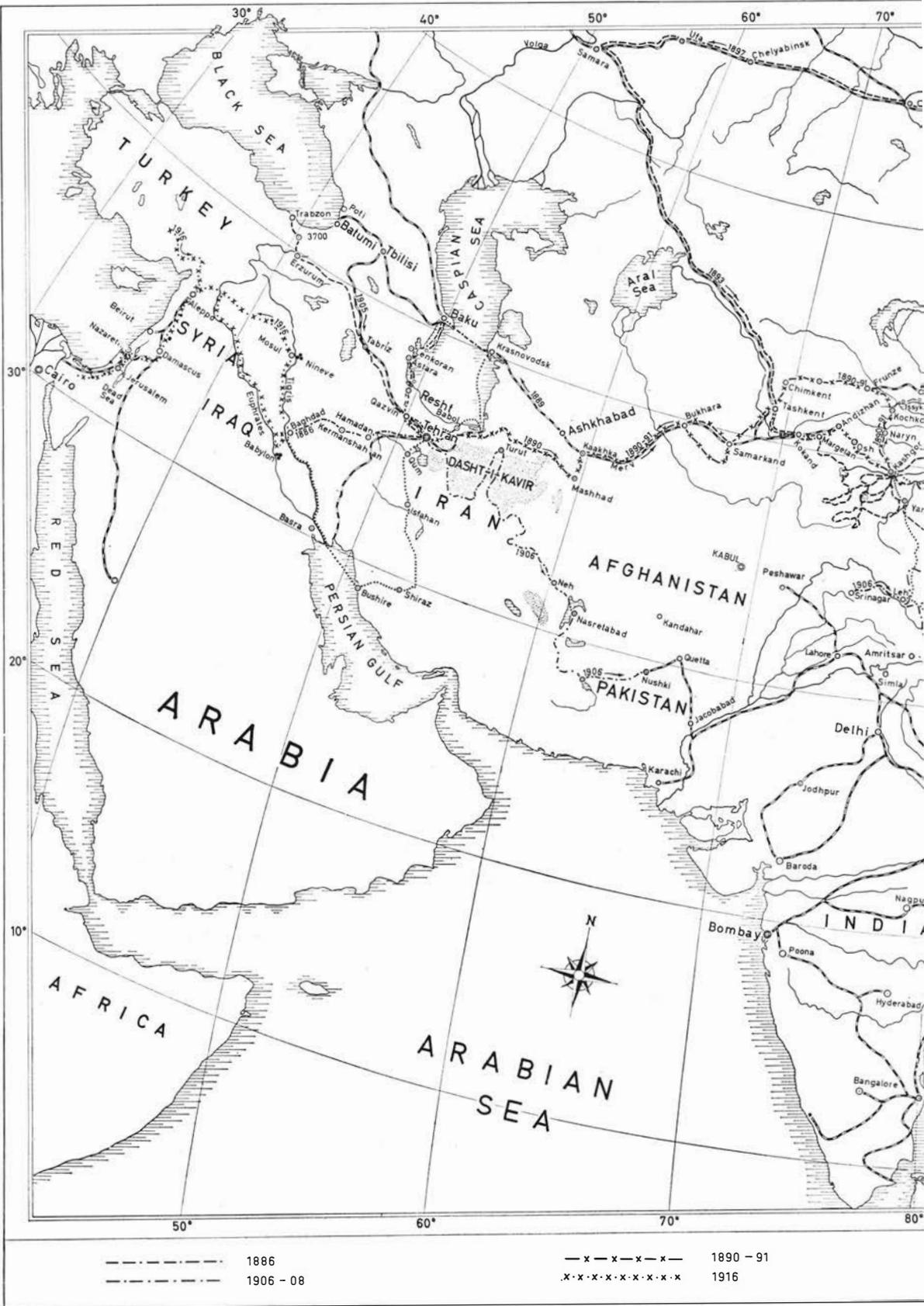
Experiences recalled maintain their spell and we can scarce believe that wellnigh three decades have passed since the gates were shut behind us. That one of our colleagues already has attained "dedication volume age" is a bewildering fact that simply has to be accepted. It is gratifying, however, that for Erik Norin the hour has struck when, at ease and undisturbed, he can devote himself to research.

The fact that Sven Hedin as man and scientist acted as integrator and inspirator in the expedition needs no stressing. That series of more or less independent enterprises which filled the years 1927–35 was in many respects a continuation of his own research during earlier years of travel. Problems not definitely solved previously were now to be tackled anew with zest. Erik Norin, more than anyone else, was granted the privilege of following up Sven Hedin's life work. A great deal of material remains for study, and we await expectantly the great summary of the history and solution of the Lopnor problems, in which Sven Hedin's, Erik Norin's, and Nils Hörner's contributions will be presented.

An appropriate contribution to the homage paid Erik Norin seemed to me the publication of, as far as I know, the first map of all of Sven Hedin's journeys in Asia. The fact that it has been completed at the Geological Institution at Upsala is another welcome reason.

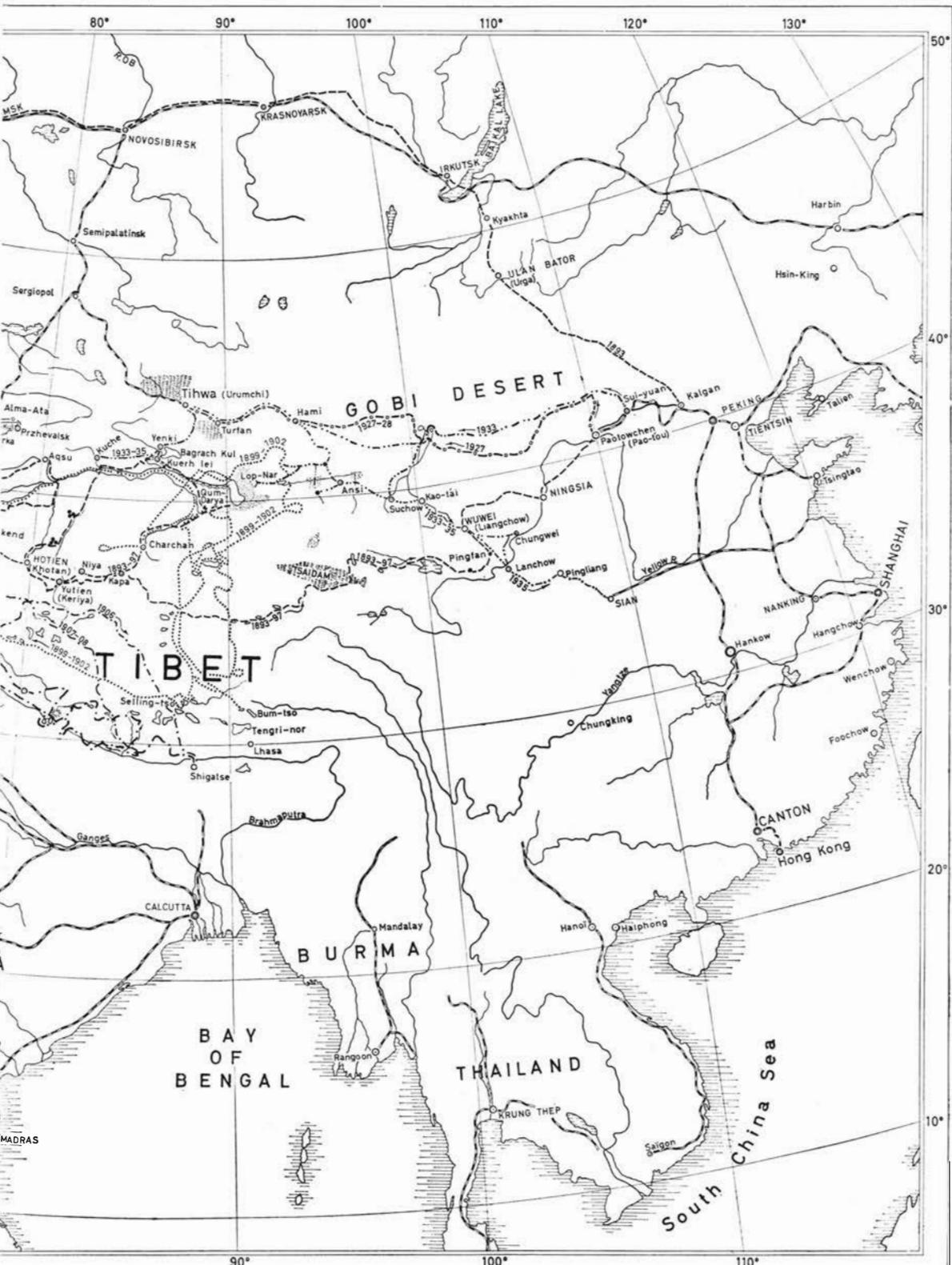


Map showing Sven Hedin's routes in Asia.



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him two years to complete, running to six heavy tomes—an incredible achievement.

To map new country, to fix topographical conditions on paper with a maximum degree of accuracy, remained Sven Hedin's great passion throughout his life. How many sheets he personally drew no one can tell. His demands as regards field-work and its methods he specified, *inter alia*, as follows: "Of my maps I craved that without claiming precision they should convey a clear picture of the country's morphology and distances covered and that around these should group themselves all such geographical features as were within sight and at all conceivable from a caravan at ordinary marching pace. The map picture should reproduce terrain forms, main features of ranges and single mountains, valleys, rivers, erosion grooves, border lines between sand desert and gravel mound, between salt desert and steppe, the extent and character of vegetation, oases, hamlets, villages, roads and paths, caravanserais, wells and springs, etc."

During his travels in Tibet and Central Asia Sven Hedin made use of a method of rapid field-mapping developed by himself and deemed extraordinary at the time. In mapping, directions were determined by compass and distances were obtained by time observations based on frequently repeated measurements of the number of seconds required by the caravan to cover a stretch of 150 metres measured by line. Bearings were also taken by compass on the most outstanding peaks, passes, valley openings, etc. Subsequently the topography was complemented by drawn panoramas meant to be studied alongside the route maps. On one occasion Professor K. D. P. Rosén checked Sven Hedin's mapping methods and found that the distance error along routes without larger terrain obstacles amounted to an average of 2 per cent, the same for the transverse error. In rugged terrain and on loose ground the average error proved to be 4 per cent. The drawn panoramas reveal an accuracy in the reproduction which permits their use photogrammetrically. By astronomical point determinations cleverly effected, Sven Hedin made feasible the fitting-in of the maps in an exact latitude-longitude network.

During the expeditionary period 1927-35 the field-mapping could be effected by augmented personnel with refined instruments and aids. Most of the Swedish members, especially Ambolt, Bergman, Bexell, Bohlin, Hörner and Norin, by their maps have furnished essential contributions to the exploration of Central Asia. A great deal has already been published in the scientific series of the Expedition, but the great map compendium is not yet completed. Since the start this work has been carried on under the direction of Erik Norin and we sincerely trust that he soon will see this monumental opus presented to the scientific world.