

when the river course changes. The lake together with the lower part of the Tarim has therefore been compared with a pendulum.

We cannot follow all the minor changes in the river course, as there does not exist any map covering the whole region of the lower Tarim. Such a map can only be made from the air. It has been possible, however, to determine the major changes of the main water courses, especially thanks to Dr. HEDIN's untiring efforts.

The southernmost position, which the terminal lake of Tarim can occupy coincides with Qara-qoshun, and the northernmost position must nearly coincide with the present new lake Lop-nor. Between these southern and northern limits Lop-nor alternates. There have possibly existed intermediary stages, but we have no definite facts about them. Cf. the map Fig. 36.

It is hardly necessary to relate here how these river displacements were investigated, as a special volume of the Report series will treat the Lop-nor and the lower Tarim region. I will only summarize some main points bearing on the subject of archaeology and draw some conclusions.

During the latter part of the second century B. C. the main part of the joined waters of the Tarim and the Könche-darya had an easterly course, probably along what is now Qum-darya. The water apparently continued to flow thus until about 330 A. D. The latest dated document from Lou-lan bears the year 330 A. D., and it seems to mark the end of the Lou-lan occupation. It is very likely that the abandoning of Lou-lan was caused by a decreasing water supply in the Tarim of that region, i. e. the river had taken another course around that time. If this supposition is correct, we have here the first known displacement of the river.

Our knowledge of how the river behaved from the fourth to the nineteenth centuries is very limited. In historical records there is nowhere any mention of a revived Lou-lan. Certain observations made by STEIN, HÖRNER and myself indicate that the Quruq-darya bed carried water for at least one shorter period in relatively modern times (Stein 1921, pp. 359 sq and 386, 1928, p. 286; Hörner 1935 p. 152). Possibly that river course was also active some time between 600 and 1000, as indicated by the occurrence of some graves.¹ HEDIN noticed living poplars in two places and living tamarisks in one place near the then dry bed of Quruq-darya to the east of Yardang-bulaq (Hedin 1905, pp. 59, 61, 63). Subsoil drainage from Quruq-tagh may partly account for these phenomena, but it is also likely that a temporary wet period of Quruq-darya was the single cause of these signs of vegetable life.

In 1877 PRJEVALSKY discovered the Qara-qoshun lake in the southern part of the Lop-nor depression, a lake formed by the Tarim and the Könche-darya; during high water periods Charchan-darya was also a tributary to this lake. Until lately Qara-qoshun has played the rôle of ancient Lop-nor on the maps.

RICHTHOFEN objected to the identification of Qara-qoshun with the ancient lake

¹ The travels of the Nepalese HBAL RGYAL-SUM via the Lou-lan station would seem to have occurred during this period (Konow 1934, p. 138 f.).