

Archaeo-
logical
evidence for
pulsations
critically
examined.

It does not come within the scope of the present work to attempt a critical analysis in general of this theory which the distinguished American geographer has set forth with great lucidity and captivating literary skill in his *Pulse of Asia*. But since many of the specific arguments there advanced are derived from observations and inferences concerning the ancient sites between Khotan and Lop-nōr which I explored in the course of my journeys, it appears to me obviously desirable that I should indicate clearly in each case what I think systematic archaeological research can safely establish as regards the climatic changes assumed, and what lies beyond its power to prove. The distinction is particularly needful, because in the absence of direct historical information which could throw light on such changes in the Tārīm Basin, Professor Huntington has been led to deduce their chronology mainly from what antiquarian evidence he believed available, and in the reverse way to reconstruct the history of economic and cultural development in this region from the climatic pulsations determined on this basis.

To turn now to the tract which extends along the southern edge of the Taklamakān between Chīra and Keriya, it is certain that the water brought down at the present time by its rivers would be quite insufficient to reach so distant a site as Dandān-oilik. Nor would it be adequate to irrigate, besides the actual oases, the whole of the adjoining area which can be proved to have been cultivated during the pre-Muhammadan epoch. But a recognition of this fact by no means justifies the assumption that, because desiccation has rendered areas once cultivated incapable of reoccupation after long centuries, their original abandonment must have been due to the same cause.

Variety of
possible
factors
causing
abandon-
ment of
cultivation.

Where man's struggle with adverse conditions of nature is carried on by a highly civilized community, such as archaeological exploration reveals to us in these ancient oases of the Buddhist epoch, human factors introduce elements of complexity which must warn the critical student to proceed warily, and to look for definite historical or antiquarian evidence before drawing his conclusions as to the circumstances and events which determined the desertion of these settlements. Where cultivation is wholly dependent upon a careful system of irrigation, and where the maintenance of the latter is possible only by the organized co-operation of an adequate population, as in these oases adjacent to, or surrounded by, the most arid of deserts, a variety of causes apart from the want of water may lead to the gradual shrinkage or complete abandonment of cultivation. Reduction of population through invasion or pestilence; maladministration and want of security arising from prolonged disturbance of political conditions; physical calamities, such as changes in river courses with which a weakened administration would not adequately cope, etc., might all individually or jointly produce the same result.

Evidence for
abandon-
ment of
Dandān-
oilik.

Thus for Dandān-oilik we have significant evidence in an official Chinese document of the year A. D. 768 found there, which has been fully discussed in my former Detailed Report.¹¹ This shows in most authentic form that the settlement, finally abandoned soon after A. D. 790, as other dated records prove, had already in A. D. 768 lost a part of its population which had retired to the main oasis owing to the depredations of bandits. In view of this explicit contemporary record there is every inducement for the historical student to connect the final abandonment of this outlying oasis after A. D. 790 with the great political upheaval of the years immediately following, when Chinese authority in Eastern Turkestan after long-drawn struggles finally succumbed to Tibetan invasion. We know from the devastations which accompanied Tibetan predominance elsewhere at that period, that the disappearance of organized Chinese control and protection must have resulted in prolonged political troubles throughout the Tārīm Basin. Without an effectively administered system of irrigation and an adequate population, cultivation in that arid region cannot successfully maintain its

¹¹ See *Ancient Khotan*, i. pp. 266, 284, with M. Chavannes' translation and notes of the document, pp. 521 sqq.