



Fig. 183. THE MASAR OF ORDAN PADSCHAH.

hundred years to the age of the city.»\*

Since that date these ruins have been visited by Dr M. A. Stein, who through the discovery of documents was enabled to state, that »the ruins were in reality abandoned only about the close of the eighth century of our era».\*\* According to Stein's map the distance between the site of these ruins and the southern edge of the desert is 68 km. If then the town was abandoned 1100 years ago, the sand must have advanced

meridionally 62 m. every year. But since the prevailing winds in that region blow from the north-east and east (even in January the form of the dunes gave evidence of the wind's blowing from those quarters), the rate at which the dunes advanced must really have been much greater, because their course will have been a diagonal one, not a course at right angles to the edge of the desert. I hasten however to observe, that these calculations are of doubtful value, especially as we do not know whether the ancient town, at the time when it flourished most, or at all events at the time when it was deserted, actually stood on the edge of the desert. My estimate however was based on the assumption that the desert-sand originated *after* the town was deserted. *One* fact is however established beyond all question by the existence of this sand-buried town, as well as by numerous legends,\*\*\*

\* *Through Asia*, II. pp. 802—3.

\*\* *Sand-buried Ruins of Khotan*, p. 324.

\*\*\* As to the different velocity and different dunes, depending upon their situation and their dimensions and the proportionality of the velocity to the mass of the dune, I may refer to Vol. I, p. 271 and 272, where I have laid down my opinion by help of some illustrations. I am glad to find exactly the same opinion expressed by Baschin in the following words: »Der Grund dafür, dass die hohen Wanderdünen langsamer vorrücken als niedrige Dünen liegt einfach darin, dass unter sonst gleichen Bedingungen bei einer hohen Düne eine längere Zeit erforderlich ist, um an der Leeseite so viel Material anzuhäufen, dass eine merkliche Vorwärtsbewegung des Dünenkamms eintritt als bei einer niedrigen. — Die Sandzufuhr durch den Wind ist ja bei hohen und niedrigen Dünen die gleiche, aber bei einer zehnmal höheren Düne muss die zehnfache Menge Sand auf der Leeseite abgelagert werden, um ein Vorrücken um den gleichen Betrag zu ermöglichen, sodass also die Geschwindigkeit der Vorwärtsbewegung direkt proportional zu der Höhe der Düne ist.» (Otto Baschin: »*Dünenstudien*, in *Zeitsch. d. Ges. f. Erdk. zu Berlin*, 1903, No. 6, p. 425.) Speaking of the same thing Rolland says: »De fait, les grandes dunes du Sahara algérien marchent, dans leur ensemble, vers le Sud-Est, mais très lentement. Cette marche, presque nulle pour certaines chaînes, est d'autant plus sensible que le dépôt des sables dépend moins du relief sous-jacent et que les dunes emmagasinent moins d'eau, le relief étant fixe et l'eau contribuant aussi à fixer les dunes. Les exemples d'avancement rapide, pour des dunes de quelque importance, sont fort rares et tout à fait locaux . . . Les grandes dunes marchent, elles s'élèvent, elles s'étendent. Leur progression n'est pas, en général du moins, notable dans la durée d'une génération; mais elle n'en est pas moins continué: d'où une modification graduelle de l'orographie du Sahara.» In this connection I will quote also two of the very important general laws, in which Rolland is summing up the results of his dune-investigations: »Le va-et-vient des sables sous l'action alternative des courants atmosphériques, se traduit finalement par un transport suivant la