

determining the increase in the eastern waterway during the four years, because we do not know what alterations the Tokus-tarim has undergone in the interval. But in the course of my farther journey northwards I shall have an opportunity to collect more abundant data bearing upon the solution of this problem.

In the afternoon the temperature of the water of the Tarim was  $12^{\circ}.2$  C., and of the water of the upper canal  $13^{\circ}.6$  C., it having been warmed in the sun in the shallow lakes. The latter was transparent to a depth of 2.02 m., but the water of the Tarim down to 0.12 m. only, a proof that the stream in these lowermost reaches carries enormous quantities of sedimentary matter; indeed it has with this succeeded in filling up large portions of the former extensive lake of Kara-buran. After this and its sister-lakes have been completely filled, it will be the turn of the Kara-koschun, unless it has in the meantime, from this and several other causes, altered its situation.

Here we observed on the bank of the Tarim three different water-marks; the top one 0.75 m. above the then existing level of the river, indicating the height when the ice first began to form in December; the middle line, 0.40 m. above the existing level, showing in all probability the maximum level to which the spring freshets (*mus-suji*) rose; and the third line at 0.23 m., indicative probably of a level maintained for a longer period at a later stage of the spring freshets.

The following information with regard to the yearly changes that take place in the river at this point were given me by the inhabitants of Schirge-tschapghan. The water is wont to be especially high at the time the ice forms; but during the winter it drops underneath the ice-sheet, so that this last assumes a concave appearance. After the ice breaks up, in the beginning of March, it is followed by the *mus-suji*, or *ullugh-su* («big water», «high water»), which by the middle of April is falling rapidly, as it was at the time of our visit in 1900. And this subsidence goes on day after day until in the end of July the river reaches its lowest level,  $1\frac{1}{2}$  kulatsch (= 2.6 m.) lower than in April. In the end of August the river begins to rise again, quickening its rate of rise in September, and attaining its maximum in October, so that it is still high in November and the beginning of December, when the ice once more begins to form. At this season a rather interesting occurrence takes place, which, though I had no opportunity of observing it directly myself, nevertheless from the account furnished to me sounds very likely true. In November, after the main mass of the high flood has rolled past, the river drops a little. Then towards the end of the month the *kömul*, or «drift-ice», puts in an appearance and drifts past Tschegelik-uj in enormous quantities. This, being arrested in the first kamisch lakes it comes to, gives rise to a stoppage or damming-back of the water, and so leads to a very appreciable rise at Schirge-tschapghan; and the ascending or retrogressive wave can be readily seen a good distance north of Arghan. This stoppage, which at the same time occasions a retardation of the rate of flow, gives the signal for the formation of the ice, and from that point the freezing advances rapidly upstream. The natives who dwell on the banks of the Tarim are all generally agreed, that the river freezes from below upwards, and that is indeed very probable, for it is easy to imagine that similar stoppages may occur at several suitable places in the bed of the river.