

a day's journey above Orosaning-uji, traverses a very sandy region, sparsely dotted with poplars, and finally enters the Tarim below Siva. The tract of country between the Tarim and the Kurugen-ögen is occupied on the south by poplar woods and on the north by sandy desert and steppe, and this conformation extends likewise across the last-named watercourse. The latter district is now entirely uninhabited.

November 29th. The fall was  $\pm 0$ ; the transparency, 7.2 cm. at 7 a. m. and 6.9 cm. at 1 p. m. The temperature of the surface water was now at the freezing-point, and it was only the movement of the current which kept it from freezing. From many different quarters we were told that, after the drift-ice had begun to appear, a single storm would suffice to bind the entire river in glacial fetters in the course of a single night; but if the weather remained calm, the drift-ice would continue to show for about ten days. All the bays and creeks and quiet reaches which were cut off from the stream were now sheeted with ice strong enough to bear a man, and every morning our ferry-boat and its attendant canoes were frozen fast, the ice being of the same strength as it was in the detached pools, and the craft had to be chopped out to get them free. Where the current was feeble, or there was none at all, a fringe of ice formed all along the banks, and every day these fringes grew thicker and broader, gradually contracting the belt of slowly moving water between them. A more or less thin belt of ice was by this formed round every alluvial deposit, as also round every piece of drift-wood that stuck up from the bottom of the river. All the moist parts of the channel, which were exposed, were frozen as hard as stone. In the morning the river was quite white with drift-ice. Through the action of an eddy close beside our camp the ice-disks were packed a foot high all along the edge of the ice in the bay where we were frozen in. At noon the stream was still half covered with drift-ice, and at 7 p. m. fully one-third of the quantity that there had been in the morning was still left, and at a late hour of the evening it had not all gone. Thus the river had taken one step more towards its winter lethargy, in that it now bore drift-ice throughout the twenty-four hours, while the drift-ice itself was increasing in thickness and in size. According to what the natives told me, the only things that could now banish it for say 48 hours or so would be bright sunny days and cloudy nights.

A closer examination of this *kömul* or *kade* showed, that it consists entirely of minute needles, flakes, and crystals of ice, all as thin as paper, and pressed together into compact masses, which glisten like new-fallen snow the moment they appear above the water, but when within it partake of its colour. The form they usually assume is that of disks, seldom more than one meter in diameter. The circular shape is imparted to them partly through rubbing against the banks, partly through natural friction when they come into sections of the current which move with unequal velocities. The same causes produce on the edge of each disk a flange or rim of soft, slushy ice, which turns snowy white the moment the water runs out of it. In consequence of this, the drifting disks look like wreaths of, say, immortelles floating on the surface of the river. Every time they jostle against the projections of the bank, or come into collision with other ice, a slight oscillation is set up in them, whilst at the same time the flange, at the point of impact,