dant flowers, its remarkable resistance to disease, and its capacity to produce so many outstanding hybrids, Japanese flowering crab must be among the most widely planted ornamental crabs. As is true of most such crabs, *M.* ×*floribunda* has small, long-pediceled, bird-distributed, yellow-brown fruits of no culinary value.

'Niedzwetzkyana'

With the exception of 'Niedzwetzkyana' (Plate 12), large-fruited *Malus pumila* is not an important contributor to ornamental crab breeding. Due to its striking appearance, this particularly dark form of *M. pumila* was introduced into the British Isles in 1894 and then, from another collection, into the United States in 1897. Niels Hansen was a plant hunter and a grower at the South Dakota Agricultural Experiment Station in Brookings who obtained his seminal importation from a Mr. Niedzwetzky of Almaty, Kazakhstan, and crossed that plant with *M. baccata,* giving rise to the Rosybloom group of ornamental crabs (Fiala 1994). Many Rosybloom cultivars have a striking crimson skin and flesh as well as their most outstanding feature: brilliant crimson petals. In their original wild forms and as modern hybrids, they are very much a part of the U.S. ornamental crab program. The flesh of many, if not most, Rosybloom cultivars is attractively spotted, tinged, suffused, or even wholly crimson. Nevertheless, they are mostly inedible. It is also possible that the ornamentals 'Wisley Crab' and 'Harry Baker' may have originated from the English introduction, but this has been neither confirmed nor refuted by microsatellite or similar DNA analyses. It was claimed by I. V. Michurin that the ornamental 'Belfleur Krasnyi', raised in Murmansk, Russia, in 1914, also had *M. pumila* 'Niedzwetzkyana' as one of its parents (Fayers 2002). Again, this speculation needs testing by modern methods, and statements as to parentage in the pre–DNA analysis literature should be treated with caution.

'Niedzwetzkyana' seems to be a rare color mutant of *Malus pumila* found at very low frequency throughout the Tian Shan and seen as fruits for sale in the Asian markets. Although sometimes treated as a distinct species, it is no more than a variant of *M. pumila.* The leaves, petioles, stems, and even the young wood are purplish red, but the rose-purple flowers are particularly spectacular. The fruit is of medium size, conical and ribbed, with a dark, claret red flesh, often crimson throughout the whole pulp. The flesh is juicy but virtually tasteless and of no culinary importance. The plant is very rarely found now in the wild because of its ornamental value. Even at the seedling stage its future promise can be detected, and local villagers or herdsmen dig up young plants and sell them at a premium in markets. Probably both deliberately and accidentally, *M. pumila* 'Niedzwetzkyana', with its striking flowers and fruits and capacity to hybridize,

has entered into ornamental breeding. It seems very likely that some of the ornamental crabs of our gardens derive, in part, and entirely accidentally, from it.

There is an early but not wholly convincing explanation for the red pigment of the apple flesh typical of 'Niedzwetzkyana'. It centers on Micah Rood, a prosperous farmer at Franklin, Pennsylvania. One day in 1693 a peddler of jewelry called at the farmstead and next day was found murdered under an apple tree in Rood's orchard. The farmer was never prosecuted, but the following autumn all the apples of the fatal tree were stained red in their flesh. Shortly afterward, in unexplained circumstances, the farmer was found dead. The phenomenon is now called Micah Rood's Curse (Room 1998).

A more likely explanation for the red-stained flesh in some apples is as follows. As far as can be ascertained, among the diverse *Malus pumila* trees in the fruit forest there are individuals with a multiallelic form of control for rich anthocyanin production, hence the bright color of a phase 1 apple. When these multiple loci come together in a particular combination and high frequency, the result is not only a brilliant red fruit skin, with usually red foliage, young stems, stem tissue, bark, and buds, but also occasionally partly or completely red fruit flesh. This is characteristic of the cultivars 'Beauty of Bath', 'Bloody Ploughman', 'Discovery' (Plates 6 and 7), 'McIntosh Red', 'Reinette Rouge Étoilée', 'Spartan', and 'Ten Commandments'. 'Niedzwetzkyana' is likely, therefore, simply manifesting an extreme expression of these particular gene sequences.