danger of severe frost, in order to get the apples sufficiently mature that the flavor will develop and that there will be a fair color. The wood of such trees, also, is equally slow in arriving at that stage of ripeness which will enable it to withstand the winter, as has been proven by the figures given above.

Some winter apples are hardier than others, but from our experience with a large number of varieties we are forced to conclude that unless the fruit of a variety reaches a certain stage of development or maturity every season a certain time before it has to be picked, owing to danger from severe frosts, that variety is not a safe one to plant. What that stage of maturity is we cannot at present definitely say.

In a nutshell, then, it is a physiological impossibility for the majority of winter apples which have yet been produced to prove hardy in the northern parts of the United States and the colder apple districts of Canada, because the trees having originated where the season is longer grow too late for our short season. Must we then conclude that the origination of a hardy winter apple for the north of good color, and the best dessert quality, is an impossibility? I believe not. Apples that will keep nearly all winter when grown in some districts are autumn apples elsewhere. Some of the hardy varieties of Russian apples which have been introduced, are found to be much earlier in season in America than they are in Russia. The growing and ripening season in two countries, or districts, while about the same length of time, may vary sufficiently to cause a marked difference in the season of a variety. As an example, I should like to refer again to Prince Edward Island, where there is a late spring, but where severe frost does not come until late, and to the colder parts of Ontario where the spring is early but where fall frosts are early also. In order, then, to get an apple most suited to a district or climate, and to get it of the season required, it must be originated in that climate.

The work of originating apples has been comparatively recent in the northwestern states, and in the colder parts of eastern Canada, and by far the largest majority of seedling apples of merit which have been produced are summer or autumn kinds. This is due to two principal causes. In the first place, because most of the seedlings have been raised from summer or autumn varieties, and we should naturally expect that most of such seedlings would be of the same season as their parents. In the second place seedlings have been raised from the best late-keeping varieties, but which are not hardy enough to stand a test winter, and the seedlings from such trees have not, as a rule, proven hardy.

I do not believe that because seedlings are raised in a climate with a short season that the largest proportion of them will prove early apples regardless of their ancestry. In most cases in the past the ancestry of seedling varieties originated in the north has not been favorable to the production of hardy winter varieties. The importance of ancestry in the origination of a hardy winter apple is well illustrated in a number of crossbred apples which have fruited at the Central Experimental Farm. Of a cross between Scott Winter, male, and McMahon, female, made by Prof. John Craig when horticulturist, 23 trees have fruited. None of these are earlier in season than McMahon, and 14 of them are later keeping apples. Practically all of them have some visible resemblance to the parents, and some are very similar to both parents. All withstood the test winter of 1903–4.

The basis for the production of the desired winter apple for the north should be a variety or varieties which have withstood test winters in the north, and are also the latest keepers of such varieties. It has been said already that late-keeping varieties mean late ripening of wood, hence tender trees; but such late-keeping, hardy varieties as have already been originated in the north, are of a different class. They are varieties which, although they mature or are fit for use early in the winter, yet keep all winter with good care. The fact that they are fit for use early means that the wood has ripened comparatively early, and hence is able to withstand the cold. Pomologists are well aware that certain varieties of fruits which are ready for use at the same time as other varieties will keep much longer. It is to this class that the desired winter apple for the north will belong.

The following winter varieties originated in the north stood the test winter of 1903–4 at Ottawa, and are just such apples as have been described: Canada Baldwin, originated in the province of Quebec; Winter Rose, originated in Dundas country, Ont.; Calumet, originated in Calumet Island in the Ottawa River; Baxter, originated near Brockville, Ont.; La Victoire, originated in the province of Quebec; Stone, originated in Vermont; Scott Winter, originated in Vermont; Milwaukee, originated in Wisconsin.

Other promising unnamed late-keeping seedlings, obtained from the colder parts of Canada and the United States, are growing at Ottawa. We have also crosses and seedlings of our own production which have not fruited, from which something good is expected. None of the varieties above mentioned have all the desired points, but we consider the outlook very bright for the origination of a hardy, productive, long-keeping variety of good color and best dessert quality for the north.

Apple Tree Top Grafted with Two Varieties on Hardy Stock

One variety winter-killed, other uninjured and requiring props to support load of fruit. It shows how a hardy stock does not increase hardiness of a variety to stand a test winter. Hardy variety is Milwaukee; tender variety, Martha apple (not Martha crab).

Eat more fruit and less meat.