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A Study of Northwestern Apples

N.E. Hansen
South Dakota Agricultural College

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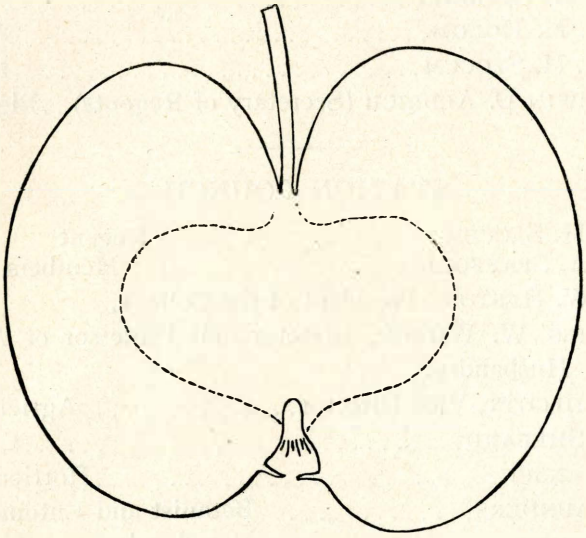

"THE APPLE—THE KING FRUIT OF THE TEMPERATE ZONE."

A Study of Northwestern Apples

N. E. HANSEN.

Department of Horticulture.

BROOKINGS, SOUTH DAKOTA.

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A STUDY OF NORTHWESTERN APPLES.

N. E. HANSEN.

Judging from the many specimens of apples sent in for identification, or submitted at the state fairs and horticultural society meetings, there exists much lack of exact information regarding varieties. Every fruit grower knows the need of some publication containing descriptions of varieties to assist in determining the name of varieties unknown to him, the nursery catalogues usually being too brief to serve as aids to identification. During the past eleven years the writer has made an effort to make drawings and descriptions of the apples cultivated in the prairie northwest, especially South Dakota, Minnesota and Iowa. The investigation has been carried on in the orchards of the Experiment Stations, first of Iowa, later of South Dakota; at the state fairs and horticultural society meetings of the three states named; and in many private orchards. It was the original intention to include every variety in cultivation and propagation, and to construct a key to the descriptions so that varieties unknown to the reader could be readily found. With the present facilities this would delay publication too long. Hence part of the more or less complete material which has accumulated is submitted herewith, not as a complete work, but as a preliminary report, and a contribution to the history of Pomology in the prairie northwest. The writer hopes that it will blaze a path through the present jungle of northwestern apple nomenclature, and serve as the basis of more complete reports at some future time. *

The alphabetical or dictionary style of arranging descriptions has been followed as a matter of convenience for

* The apples of central Iowa, and others more eastern and southern in range, are included in Systematic Pomology, Vol. 2 of American Horticultural Manual. J. L. Budd and N. E. Hansen. John Wiley & Sons, publishers, 43 and 45 East Nineteenth St., New York City.

reference. Following this will be given brief explanations of terms used in describing apples, and an attempt at an artificial key.

After considerable study of the elaborate European systems of classifying apples into natural families, the writer is inclined to believe them too complicated for general use and that the many varieties resulting from crossing of the various distinct types present too many intermediate characters to permit of close natural classification. Hence, the thought has presented itself that it is feasible to construct a purely artificial key, based on internal and external characteristics, which would make reference to the appropriate description possible without the bewildering task of reading through the entire list.

THE ORIGINATION OF NEW VARIETIES.

For the benefit of the beginner it should be explained that varieties of apples and other fruits do not come true to seed; that is, from ten seeds saved from one apple may come ten varieties widely different in color, size, season, quality, and other characteristics. Most of these will be inferior and not worthy of propagation. If a choice variety is found the tree is named and more trees obtained by grafting or budding, which is really a means of subdividing the same individual. Most varieties have originated by chance, often coming up in fence corners or by the wayside. Every one can originate new varieties from seed, but many disappointments must be expected. Fruit growers in general cannot afford to deal in uncertainties and hence plant only well known standard varieties. The cultivated apple is a native of Europe and Asia and has been under cultivation from prehistoric times. However, the race of apples which was brought to America early in the seventeenth century from the moist coast regions of western Europe has not proved hardy in a considerable part of the northern Mississippi Valley. It has cost, at a low estimate, considerably over a hundred million

dollars to determine this lack of hardiness. This has led to the extensive planting of seed of the best varieties in the hope of obtaining new sorts better adapted to our peculiar climate. This inability to resist severe cold is not apparent every winter and this has delayed the solution of the problem. The so-called "crucial test winters," such as 1855-6, 1872-3, 1884-5, and 1898-9, occur at irregular intervals and the winter of 1898-9 was a root-killing winter rather than a real test winter. In the intervals between the periods of extreme cold, when orchards are wiped off the map, a host of seedlings of local fame come to the front and are sometimes boomed extensively, only to drop out of sight after the next visitation. It is now well demonstrated that an apple seedling that has never been transplanted, or at least transplanted only while quite young so that the tap root was not disturbed, may be hardy so far as the original tree is concerned, but may prove very tender under propagation in the nursery. This has been the history of hundreds of seedlings during the past fifty years. Again, some varieties of a greater degree of hardiness prove hardy until they come into full bearing, when they quickly succumb as a result of the weakened condition caused by the heavy crop, especially if the succeeding winter happens to be a severe one. This fact is now generally understood by well informed growers, but most of them in their enthusiasm forget it owing to the considerable interval of time between the test winters. In fact, some even think that the climate of the northwest is changing for the better and that the experiences of early days will not be repeated. But this comforting belief is entertained by but few of the older fruit growers. It is now maintained by the best informed fruit growers, that the only test for the hardiness of any variety of the apple is for it to be propagated in the nursery, come into bearing in the orchard, pass unhurt through a test winter and have sufficient vitality left to bear a good crop the following season. The importance of this subject may be inferred from the standing offer of the Minnesota State Horticultural Society of

$1,000 premium or bonus to anyone who will originate an apple as hardy as Duchess, equal in size, quality and appearance to Wealthy, and of keeping capacity equal to Malinda. The Iowa Society made similar offers, but the reward was never claimed. An apple of the character indicated would be worth millions of dollars to the prairie northwest. This does not mean that the originator of such a variety will be able to secure so large a reward as there is really no means of protecting the originator of any variety of hardy fruit. Its production must be, to a large extent, a labor of love, and in the hope of benefiting mankind. In the very nature of things it is impossible to determine the hardiness of varieties by confining it to any one place. Its hardiness can only be determined by extended trial over a wide area presenting varying conditions of soil and climate, and by the time this is determined the variety is common property.

I do not wish to discourage the planting of apple seeds. In fact, many thousand seedlings on the Station grounds raised from the hardiest varieties show my belief in this work, but the fruit raiser should clearly understand the history of the subject. Part of the losses in trees in nurseries and orchards must be charged to root-killing, either total or partial, caused by the winter-killing of the common apple seedlings used as stocks for budding or grafting. It has been "the worm at the root of the tree" all these years. In Bulletin 65 of this Station, this trouble was discussed; also the Russian method of preventing it by using the pure Siberian crab (*Pyrus baccata*) as a stock, in such a way that the entire root system is of the crab, the Russian experience, which has been confirmed by experiments in this Station, being that no race of the standard apple now known will endure the deep severe freezing of the test winters if it happens that no snow is on the ground at the time, or the trees have not been mulched the preceding fall. Experience at this Station, since the publication of Bulletin 65, with the pure Siberian crab as a stock has shown it to be perfectly hardy without

winter protection. This tree has proved entirely hardy wherever tested in the prairie northwest, even in Manitoba and Assiniboia. A two year budded tree on this stock is fully equal in size, and superior in smoothness of stem, to an ordinary three year root-grafted tree. The Russian experience that it dwarfs the tree somewhat but makes it bear earlier, remains to be proven by further experiments.

Without entering into the Russian apple controversy it must be admitted that these Slavonic sorts introduced an element of greater hardiness into our prairie Pomology and made the cultivation of apples practicable much further north than would otherwise have been possible. The fact that some proved tender, many subject to blight and others of shorter season than was the case in their native home, is well established. However, it should be borne in mind that Russia is a country of vast area, covering one-seventh of the earth's surface, and that the hundreds of varieties imported were from localities varying greatly in climate. Certainly the all essential point of hardiness has been secured as a result of the Russian apple importations, and hardiness comes before everything else. Due credit should be given for this to Prof. J. L. Budd and others, who have led and aided in this great work. Where hardiness is not a prime consideration, the Russian apple is not needed with a few well known exceptions.

Prof. L. H. Bailey *states the case as follows:

"There are ardent advocates of the Russian varieties, and there are others who see nothing good in them. There are those who believe that all progress must come by securing seedlings from the hardiest varieties of the eastern states; there are others who would derive everything from the Siberian crabs, and still others who believe that the final result lies in improving the native crabs. There is no end of discussion and cross-purposes. In the meantime, nature is quietly doing the work. Here is a good seedling of some old variety, there a good one from some Russian, and now and then one from the crab stocks. The new varieties are gradually supplanting the old, so quietly that few people are aware of it; and by the time the contestants are done disputing, it will be found that there are no Russians and no eastern apples, but a brood of northwestern apples which have grown out of the old confusion."

* Plant Breeding, page 133.

The apple is indigenous over a large part of Europe and Asia, including parts of the cold, dry climate of eastern European Russia. In general, it is known that trees and shrubs extending over a wide geographical range vary greatly in hardiness according to their locality. This variation in hardiness points to a slow process of acclimation by nature. De Candolle writes in "The Origin of Cultivated Plants:" "The northern limits of wild species * * * * have not changed within historic times although the seeds are carried frequently and continually to the north of each limit. Periods of more than four or five thousand years, or changements of form and duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold."

If the above generalization be true in the case of the apple, and experience indicates that it is, it is certainly most advisable to plant the seeds only of the hardiest known varieties as it would take too long to get a hardy race from apples originally indigenous to the milder climate of western Europe. This is offered as a suggestion only, and may be a new way of looking at the apple seedling question.

A new era is now opening up in the history of apple culture in the prairie northwest. Instead of planting seeds of eastern and southern apples, which have been shown by hundreds of trials to produce a race so deficient in hardiness as to be wiped out by the next test winter, people are planting seeds only of the hardiest known varieties, which are largely of Russian origin. Much crossing is also being done with the Russians, Siberians and our choicest winter apples of the eastern states. Whether perfect hardiness and long keeping capacity can be combined in this way remains to be proved. It is certain that we have now many choice hardy varieties for summer, fall and early winter. The fruit grower in the Dakotas and the larger part of Minnesota and northern Iowa, should confine himself to these varieties for the present and not insist in planting too many winter sorts. How the true

all winter-keeper can be obtained is still a problem. In common with some others, the writer is inclined to the belief that it will be necessary to use the native crab of the northern Mississippi valley in breeding the long sought for winter apple.

This bulletin is offered as a contribution to the history of this transition period.

THE RUSSIAN APPLE NOMENCLATURE COMMISSION.

It is well known to fruit men that the nomenclature of Russian apples imported into the northwest is much mixed. There are various reasons for this confusion. The scions as originally imported were in many cases mixed, and in Russia itself the nomenclature has not yet been fully worked out for all parts of the fruit growing sections. To this must be added errors in handling such an immense list of varieties in this country. Also the fact that among the great number of Russian apples are found well-defined groups or families. By this is meant that some varieties so closely resemble each other as to be nearly or quite identical. Slight differences may be apparent in season, quality, size and appearance of fruit, and in habit and other characteristics of tree, but for all practical purposes they are too nearly the same to warrant more than one representative of the group being put into general cultivation. To cut down the list would greatly simplify matters pomological, and the need of it has long been felt.

In order to make a beginning in this work the State Horticultural Societies of Minnesota, Iowa, Wisconsin and South Dakota appointed a Commission, which met in La Crosse, Wisconsin, August 30 and 31, 1898. Wisconsin was represented by A. G. Tuttle, of Baraboo, Prof. E. S. Goff, of the State University, and by A. J. Philips, West Salem. Iowa was represented by J. B. Mitchell, of Cresco, C. G. Patten, of Charles City, and J. Sexton, of Ames. Prof J. L. Budd, of the Iowa Agricultural College, the highest authority

on Russian fruits, was represented by Mr. J. Sexton, his chief assistant for the past twenty-three years. Minnesota was represented by J. S. Harris, of La Crescent, Prof. S. B. Green, of the University of Minnesota, and Clarence Wedge, of Albert Lea. South Dakota was represented by the writer.

All the members were present except Prof. Goff, who was unavoidably detained from attending the meeting. The Commission was called to order Tuesday morning, August 30. Upon unanimous motion Mr. A. G. Tuttle, the senior member of the Commission, was elected temporary President. Mr. Tuttle thanked the members for the honor conferred, but stated that his eighty-three years ought to excuse him from the heavier duties of the meeting. The Commission adjourned to the Inter-State Fair at the La Crosse Fair grounds to inspect Mr. Tuttle's large collection of Russian apples. Upon returning, the work of unpacking sample apples brought by the various members was completed and the Commission was ready for work.

Clarence Wedge was elected President and N. E. Hansen Secretary. Mr. Wedge said that our object is to find out our agreements rather than our differences; to correct the nomenclature rather than to get at their value as varieties.

The following resolution was unanimously adopted as a preamble to the groups or families of apples brought under consideration:

> "The varieties here grouped as members of the same families, while in a few cases differing somewhat in characteristics of tree, are so nearly identical in fruit that for exhibition and commercial purposes they are practically the same and should be so considered."

This does not mean that all the varieties in any one group are identical, nor does it mean that they are to be all mixed up in propagation, but simply that the Commission considered them too nearly the same for more than one representative to be recommended for cultivation. The variety named in the heading of each group is the one considered to be the best one. For example, twelve names are given in the

Hibernal group; whether these are identical, reproductions or distinct, will probably never be known. The Commission selected Hibernal as being on the whole the best representive of the group and the others are dropped from the lists, at least for the present.

In the following lists the word "spurious" indicates that the name preceding it properly belongs to another variety with which it has been mixed. The word "group" or "type" may be used if preferred for the word "family." The descriptions adopted serve to fix the varieties which have attracted special attention in part or all of the region represented by the Commission. No attempt was made to make a complete report on the Russian apples. The numbers indicating size of fruit are according to the scale adopted by the American Pomological Society.

In the following lists the heading of each group is the name adopted as the official name for the group.

All varieties sent out from different sources are included to help locate errors and duplicates. The season given is that on the north boundary of Iowa.

The Commission defined and described the following fourteen groups: Hibernal, Duchess, Longfield, Charlamoff, Romna, Cross, Christmas, Antonovka, Anisim, Golden White, Repka Malenka, Yellow Sweet, Yellow Transparent, Anis. Descriptions were also adopted of the following ten varieties that have attracted special attention in the northwest: Long Arcade, Bode, Lubsk Queen, Lowland Raspberry, Ostrakoff, Vargulek, Sweet Longfield, Beautiful Arcade, Zuzoff, Arabskoe. These twenty-four varieties have been included in their regular order in the following pages, as a matter of convenient reference.

A. G. Tuttle, of Baraboo, Wisconsin, named the following as the best six of those he has tested, the varieties being in the order of their value. Longfield (a great annual bearer), Anisim, Antonovka, Beautiful Arcade (for sweet), Lowland

Raspberry (for best early quality), Repka Malenka (for late keeping).

The Minnesota State Horticultural Society varies this list. At their December meeting only three varieties were recommended for general cultivation, Duchess, Hibernal and Charlamoff, with Anisim, Longfield, Christmas, Yellow Sweet, Cross and Repka Malenka for further trial. Since then Patten Greening has been added to the list of three recommended for general cultivation as being of the first degree of hardiness.

The general consensus of opinion of the Commission tended strongly in favor of a short list, especially Hibernal, Duchess, Charlamoff, Anisim, Yellow Sweet, Repka Malenka, Longfield, Cross and Christmas. This will simplify matters for the average planter.

Meanwhile a host of seedlings have arisen all over Wisconsin, Minnesota and Iowa since the hard winter of 1884-5, and are attracting favorable attention, and it will take another winter such as that of 1872-3 and 1884-5 to weed out the list and test their true hardiness as compared with imported varieties. This will clear the horticultural atmosphere and make the task of the fruit grower an easier one, in the matter of choosing varieties both native and imported.

The aim of the Commission was not to recommend varieties for any particular locality, as that must be left to the state and local horticultural societies, but to revise and simplify the nomenclature of the varieties that have come into chief prominence in various parts of the northwest. As opportunity permits the work of revision will be continued. The report of the Commission was adopted during the succeeding winter by the State Horticultural Societies of Minnesota, Wisconsin and South Dakota, and has been generally followed by nurserymen and fruit growers.

REPRODUCTION OF VARIETIES.

The beginner should understand that although as many different varieties may be raised from seed of one apple as

there are seeds in that apple, it may also happen, especially if inbred by no other varieties being near, that some of these seedlings will be so nearly the same in all respects as the variety from which the seed was taken, as to be considered identical even by experienced pomologists accustomed to close observation of fruits. Such seedlings may be called reproductions of the mother variety. It frequently happens in vegetables and flowers that several varieties, very nearly alike, originate in widely separated localities; in such cases only the first one introduced holds its own, the others are dropped. Apples and other orchard fruits do not come true to seed, because it has not been found necessary to fix the type by a long course of selection, it being easier to reproduce the variety by grafts, buds or sprouts. Apples generally are raised in mixed orchards containing many varieties; hence, there is every facility for crossing with other varieties, the pollen being carried by insects or wind. However, some varieties show a prepotent tendency and impress their characteristics strongly upon their offspring. This is especially true in isolated localities where but few varieties are grown, since inbreeding takes place to a considerable extent. The fact that Fameuse reproduces itself so closely from seed may be due to the fact that it was the main variety grown in eastern Canada by the French Canadians after the unknown parent was brought from France; for long periods the trees were raised by the early settlers from seed, hence, the seed was inbred.

This probably explains the well marked families, types or races of the Russian apples. Over large areas grafting was but little practiced by peasants and but few varieties grown, hence, seed was saved mainly from the strongest, best trees. There is now a large group of seedlings of Duchess of Oldenburg in America, especially the northwestern states, which shows resemblance to their parent. In the southwest many seedlings of Ben Davis have appeared, many of them so near like the parent as not to be worthy of introduction, while others such as Gano and Black Ben Davis, are an improve-

ment on the parent in some respects. In the northwest a large number of seedlings of Wealthy have recently appeared, which resemble that variety quite closely. The Wolf River, which is considered to be a seedling of Alexander, has largely superseded its parent at the west because of demonstated points of superiority. The Concord grape and certain plums and peaches show a strong tendency to reproduce themselves from seed. The late Geo. P. Peffer, originator of the Pewaukee, Peffer and other apples, claimed that any apple will reproduce itself from seed if inbred by covering the blossoms to prevent access of pollen from other varieties.

BUD VARIATION.

From the foregoing discussion the reader will conclude that propagation by grafts or other mode of division will always reproduce the variety. This is so nearly true that the whole art of nursery propagation may be said to be based upon it. However, it is also true that under certain unknown conditions any one bud may change its character so as to give rise to a new variety sufficiently distinct to be worthy of a separate name. This is termed "bud variation" and is a prolific source of new varieties in certain plants, such as chrysanthemums and roses. Sometimes the change is only slight and this may be termed a subvariety. In northwestern nurseries, for instance, two Wolf plums are now recognized, the free stone and the cling; it is not known, however, whether this is a bud variation or a seedling mixture. The Wealthy apple has apparently varied somewhat under propagation and recently gave rise to remarks at the Minnesota State Horticultural Society meeting by the son of the originator, who distributed sprouts from the original tree to help settle the matter. Experienced fruit growers have long noticed that in a large number of apple trees of one variety in the same orchard some trees are more productive than others. The most advanced thinkers in this line now recognize this fact as due to bud variation and take advantage

of it by cutting scions for grafting from the best and most productive trees only. Florists long ago learned the necessity of care in taking cuttings only from the best and most productive individuals, or even parts of the plant.

WHAT VARIETIES SHALL I PLANT?

This question is the one most frequently asked in the numerous letters received by this Department. It is impossible at present to give a full list. The state is too new to permit of a list founded on actual experience in all cases. In a general way, the experience, so far, indicates safety in following the Minnesota fruit list for the northern counties, while those doing well in northern Iowa will probably be best for the southern counties.

The available experience, up to date, has been summarized by the State Horticultural Society, in preparing the following fruit list, adopted at the thirteenth annual meeting January 23, 1902, at Sioux Falls. This society was incorporated under the state laws January 9, 1890. As the state makes no appropriation for the purpose the society is unable at present to publish its annual proceedings. The fruit list is revised at the annual meeting as further experience renders it necessary. For convenience the state is divided into twelve fruit districts.

DISTRICT BOUNDARIES.

District No. 1—All that portion of the state west of the Missouri river except the Black Hills.

District No. 2—Counties of Campbell, McPherson, Brown, Edmunds and Walworth.

District No. 3—Counties of Marshall, Roberts, Grant and Day.

District No. 4—Counties of Clark, Codington, Deuel and Hamlin.

District No. 5—Counties of Kingsbury, Brookings, Moody, Lake, Miner, Hanson and McCook.

District No. 6—Counties of Lincoln, Minnehaha, Turner and Hutchinson, and north part of counties in District No. 7.

District No. 7—Strip of country about fifteen miles wide, along the Missouri river extending through the counties of Bon Homme, Yankton, Clay and Union.

District No. 8—Counties of Brule, Aurora, Davison, Douglas and Charles Mix.

District No. 9—Counties of Sanborn, Jerauld and Buffalo.

District No. 10—Counties of Spink and Beadle.

District No. 11—Counties of Potter, Faulk, Hand, Hyde, Hughes and Sully.

District No. 12—All the counties comprising the Black Hills.

APPLES.

District No. 1—For each part of this district, the varieties recommended for the district next east are recommended for trial under irrigation.

Districts Nos. 2, 3, 4—For trial: Hibernal, Duchess, Charlamoff, Wealthy.

Districts Nos. 5 and 9—Of first degree of hardiness: Hibernal, Duchess, Charlamoff. Of second degree of hardiness: Wealthy, Tetofsky. For trial: Anisim, Patten Greening, Repka Malenaka, Yellow Sweet.

District No. 6—Hibernal, Duchess, Charlamoff, Wealthy, Anisim, Patten Greening, Repka Malenka, Yellow Sweet, Longfield. For trial: Christmas, Cross, Northwestern Greening, Malinda, Plumb Cider.

District No. 7—Duchess, Charlamoff, Wealthy, Hibernal, Haas, Patten Greening, Longfield. Winter apples: Walbridge, Ben Davis, Iowa Blush, Malinda, Northwestern Greening. For trial: Plumb Cider, Willow Twig, Sheriff, Prices Sweet.

District No. 8—Hibernal, Duchess, Charlamoff, Wealthy, Tetofsky, Anisim, Patten Greening, Repka Malenka, Yellow Sweet, Malinda, Northwestern Greening.

Districts Nos. 10 and 11—For trial: Hibernal, Duchess, Charlamoff.

District No. 12—Duchess, Tetofsky, Wealthy, Ralls Genet, Prices Sweet, Patten Greening, Northwestern Greening.

CRABS AND HYBRIDS.

For All Districts—Martha, Virginia, Whitney, Sweet Russet. For trial: Lyman Prolific, Brier *Sweet*, Mary.

PLUMS.

Districts Nos. 2, 3, 4, 5, 10, 11—On northern native plum roots: DeSoto, Wyant, Wolf, Forest Garden, Odegard. For trial: Aitkin.

Districts Nos. 6, 8, 9, 12—On northern native plum roots: DeSoto, Wyant, Odegard, Hawkeye, Wolf, Forest Garden. For trial: Olson, Aitkin.

District No. 7—On northern native plum roots: DeSoto, Miner, Hawkeye, Wolf, Wyant, Odegard. For trial: Olson, Stoddard.

CHERRIES.

Districts Nos. 6, 7, 8, and south tier of counties of District No. 5—Early Richmond, Wragg, English Morello, Ostheim.

NATIVE FRUITS.

Promising for trial: Sand Cherry, Juneberry, Buffaloberry, Choke Cherry, Gooseberry. All selected plants.

RASPBERRIES.

Districts 2, 3, 4, 5, 10, 11, 12—With winter protection—Reds: Loudon, Turner, Cuthbert. Black Caps: Older, Palmer, Nemaha. For trial: Columbian.

District No. 7—With winter protection—Reds: Loudon, Turner, Cuthbert. For trial: Miller, Philadelphia. Black Caps: Gregg, Older, Palmer, Nemaha, Kansas, Columbia.

BLACKBERRIES.

District No. 7—With winter protection—Snyder.

CURRANTS.

All Districts—Red: Victoria, Red Dutch. White: White Grape.

GOOSEBERRIES.

For All Districts—Houghton. For trial: Champion, Pearl.

STRAWBERRIES.

For All Districts—Varieties with imperfect blossoms: Warfield, Crescent. With perfect blossoms: Bederwood. For trial—with perfect blossoms: Lovett, Woolverton, Brandywine.

GRAPES.

Districts 6, 7, 8, 12—Concord, Worden, Janesville.

Districts 1, 2, 3, 4, 5, 9, 10, 11—For trial: Janesville, Beta.

HOW TO RAISE APPLE TREES FROM SEED.

The beginner may now desire to raise a few apple seedlings for himself. The writer does not recommend this unless the planter clearly understands that it is an experiment and is prepared to meet with many disappointments. However, there is urgent need of much work of this kind in the northwest. In the effort to raise thousands of apple seedlings at this Station the writer has found that some modification of the nursery methods used farther south is necessary for the best results. The pomace from a cider mill is sometimes planted, seeds and all. This method s not recommended as the fermenting pulp contains an acid injurious to germination. Out of a row ten rods long only three or four seedlings were the result. The experience of others also shows that the germinating capacity of apple seed is greatly injured if it stays in the pomace more than twenty-four hours or until it begins to ferment. The pomace may be put in a

barrel and water added. If the mass is now stirred the seeds will gradually sink to the bottom and the pulp may be poured off. Where large quantities are desired a long trough with cross-partitions may be used through which the thin liquid pomace flows; the seeds are caught in the pockets between the partitions. With large apples it is found most convenient to cut the fruit in halves crosswise until the core is reached, the halves are then broken apart and the seeds removed with a knife or pointed stick.

As soon as clean the seeds are spread out to dry for a day or two and are then mixed with moist sand and buried in small boxes, with holes in the bottom for drainage, in a well drained spot in the garden. This is done in the fall before the ground freezes. The box is buried two or three inches below the surface and if snow comes too early it is removed so that the seeds will be thoroughly frozen during the winter. If the seeds are buried early in the fall the ground should be mulched with straw to prevent drying out. As early in the spring as possible the seeds should be planted. If for any reason the planting is delayed the sand should be stirred every day from the bottom to prevent premature and uneven germination.

If the seeds are saved during the winter the seeds may be kept in a dry, cool room until the latter part of February when they are soaked for twenty-four hours and then spread out on a board to freeze. When thawed out they are put in a box of sand as before. If it is not possible to bury the box it should be put in a frame on the north side of a house and surrounded with sand or coarse manure to prevent drying out by the wind.

Planting seeds in drills in the open field is not a successful method here. The young seedlings are apt to "damp off" or rot at the surface of the ground soon after germination and before the first true leaves are formed. All apple seedlings at this Station are now raised in beds four feet wide and ten rods long. The bed is bounded by boards twelve inches wide

held on edge by stakes at regular intervals. This makes a bed with a little wall or border one foot in height. The seeds are sown about one inch deep in drills ten inches apart and three or four seeds to the inch. This may be done in early spring, but fall planting is preferred as spring is a busier season and a few days' neglect causes premature sprouting. When planted in the fall the bed is mulched with coarse, well rotten manure to prevent heaving by the frost in winter. This will happen especially on clay soil. Mulch protects also from winter drought when there is no snow on the ground. This mulch should be removed early in the spring and if the ground appears baked, which will sometimes happen in spite of the mulch, the surface should be stirred lightly with a garden rake.

As soon as the young seedlings appear above the ground it is found essential to shade them. This is best done by lath screens. The interval between the laths should be the width of a lath, thus cutting off one-half of the sunlight. The screens are made a little over four feet wide and of length convenient for easy removal when necessary in long rainy spells. As soon as the second pair of true leaves form, and the crust has been broken between the rows with a small hand-weeder, the amount of shade is gradually lessened, common lath fencing being found most convenient for this purpose. The young plants will soon be fully inured to the sun and will make rapid growth with proper care. This means the removal of all weeds and breaking of the crust between the plants as soon as the ground begins to bake after a rain. Some plant seed very thickly in the bed, but this makes the seedlings too small the first year and a year's growth is lost. On the other hand, if the seed is planted too thinly, too much space is required. In a dry season water is essential at times, but a thorough soaking is then given. The amateur method of sprinkling every day is usually worse than no watering at all as it causes the surface to bake.

In the nurseries of Europe it is the common practice to

transplant the seedlings the first season as soon as the first few leaves are formed. This practice is called "pricking out," in English; "pikiren," in German gardens. The great advantage of this method is the breaking up of the tap root. At this Station it is found that a much stronger root-system is developed by this method and hence is desirable, especially where it is intended to use young seedlings as stocks for budding. However, in a dry season it is not advisable because the root are often quite crooked at the collar or point of union with the top, and this may easily be strained in digging.

For handling small lots of choice seed my most recent method is to plant the seed in flats or shallow boxes in the fall. These flats are buried for winter freezing and in the spring are placed in the frames and shaded with lath as already described. To prevent drying out the flats are sunk even with the surface. When the true leaves are well developed the seedlings with adhering earth are taken out in small blocks with a garden trowel and transplanted into seed beds. The seedlings suffer practically no check in the removal and a strong growth is secured the first year. The earth in the flats should be watered sufficiently just before transplanting so that the earth will adhere to the roots and yet not be soggy.

In the fall the young seedlings are taken up and heeled-in in the cellar or out doors. In the latter case they are covered entirely with earth and then mulched with two feet of coarse manure. In the spring they are set in nursery rows, four feet apart and the seedlings ten inches apart in the row. The first fall it is well to loosen the soil near the collar, then bend the top over and cover with earth to prevent injury from rabbits, field mice and the winter. The seedlings remain in nursery row for about two years after which the best seedlings, those with large leaves, free from thorns and of strong, vigorous growth, are transplanted to the orchard, or if not too thick they may be left in the nursery row to fruit. The fruiting may be hastened by cutting scions at the end of the first or

second year and top-grafting the following spring into bearing trees.

DESCRIPTION OF VARIETIES.

Ackers Duchess—Specimens from E. H. S. Dartt, Owatonna, Minnesota. A handsomely colored fall apple—Fruit medium large, regular, oblate; surface yellow, rather thinly striped and splashed with bright red; dots minute, white, obscure; cavity regular, russeted; stem short; basin wide, deep, abrupt, somewhat furrowed; calyx open. Core closed; flesh yellowish; subacid, good. September.

Adaline—Origin, Minnesota—Fruit medium, roundish, very regular, surface yellow, mostly covered with fine dark red, mixed, striped and splashed, nearly solid color on sunny side; dots white, minute, few; cavity regular, acuminate, slightly russeted; stem medium; basin smooth, regular, abrupt (somewhat cup-shaped); calyx open. Core closed; tube funnel-shaped, long, open to core; stamens marginal; flesh white, fine grained, mild subacid, nearly sweet, good. Winter.

Advance—A seedling of Wealthy originated by H. M. Lyman, Excelsior, Minnesota—Fruit large, roundish oblate; surface colored much like Wealthy; quality good. Season a little earlier than Wealthy. This is Lyman's No. 60, and is only one out of a large number of choice seedlings originated by Mr. Lyman from seed of Wealthy planted in 1876.

Alabaster White (No. 575)—Origin, Russia—Fruit medium, roundish, conical; surface yellow, thinly covered with marbled red with dull crimson splashes, overlaid with whitish bloom; dots white, few; cavity regular, acute; stem long; basin narrow, with fine wrinkles. Core closed, clasping; tube large, funnel-shaped, long; stamens marginal; flesh white, juicy, brisk subacid, good. Fall.

Alexander—Of Russian origin; tree vigorous, spreading, productive. In the west it is now largely supplanted by its Wisconsin seedling the Wolf River—Fruit very large, regular, conical; surface greenish yellow, faintly streaked with red on shaded side, but orange on the sunny side almost wholly covered with bright crimson stripes and splashes, a showy fruit; dots obscure, few, minute, gray; cavity regular, deep, with trace of russet; stem short, knobbed at base; basin narrow, abrupt, slightly corrugated; calyx open. Core open; cells ovate, slit; tube conical; stamens basal; seeds short, plump; flesh yellowish white, crisp, tender and juicy with a rather pleasant flavor, good. October to December.

Allington—Originated by S. A. Alling, Homer, Minnesota. First premium as seedling awarded by Minnesota Horticultural Society, December, 1901. —Fruit medium, roundish, conical, sometimes oblique; surface yellow, with bronze blush; dots obscure, numerous, minute, russet; cavity acute,

slightly russeted; stem rather long; basin corrugated; calyx open. Core slightly open, clasping; cells round, slit; tube funnel-shaped; stamens marginal; seeds eight to nine, light brown; flesh yellowish white, moderately juicy, rich, pleasant subacid, very good. Late winter.

Aluska—Origin Minnesota—Fruit medium, sharply conical; surface yellow, splashed and mixed dark red on sunny side; dots very minute, white, scattered, inconspicuous; cavity regular, acuminate, a little russet; stem very fleshy and short; basin narrow, nearly flat, corrugated and wrinkled; calyx half open. Core meeting; stamens median; flesh white, juicy, subacid, fair, use cooking. Probably late fall.

American Codling—Specimens from William Oxford, Freeburg, Minnesota—Fruit large, oblate to roundish oblate; surface green, faintly blushed bronze; dots distinct, numerous, white; cavity regular, deep, obtuse; stem short to medium; basin wide, shallow, regular, smooth, a few minute wrinkles; calyx closed, segments connivent. Core closed; sessile; cells obovate, slit; tube conical; stamens median; seeds about eight, very plump; flesh juicy; fine grained, pleasant subacid, good; excellent for culinary use. December.

"ANIS GROUP.

Anis; No. 317; White Pigeon (spurious); 984, Kursk Anis; Red Anis; 32 M; Russian Green; Blue Anis; Yellow Anis; Pink Anis; Striped Anis; Getman's Bean, 225.

DESCRIPTION: *Anis*—Size, 4 to 5; form, roundish oblate, angular; color, light green, striped with red in sun; cavity, broad, deep; stem, short; basin, broad, irregular, angular; calyx, medium, closed; core, open; flesh, tender, juicy, greenish white, with dark green water line around core; flavor, agreeable mild acid; season, September and October; origin, Russia; tree, medium upright; fruit drops easily.

A. G. Tuttle: I move that all be discarded, owing to small size.

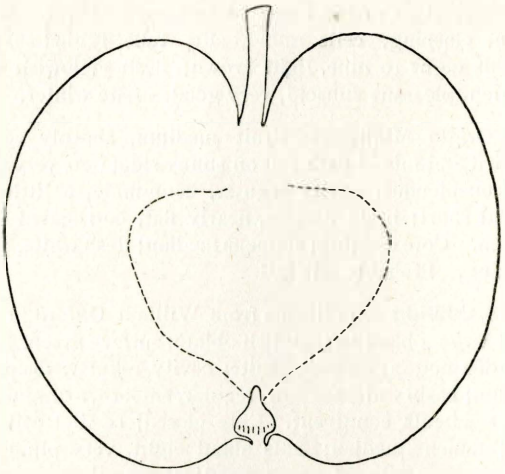
J. S. Harris: I second the motion. However, I think the Russian Green should be retained for very cold latitudes, as it is very hardy, and the tree is blight-proof. For milder sections the Anis group is too small."

(*Rus. Nom. Com.*)

Anisim—Origin, Russia. Tree a strong grower in nursery and orchard. The beautiful color of the fruit attracts favorable attention—Fruit below medium, roundish conical, slightly angular; surface greenish yellow, covered almost wholly with a beautiful dark crimson, with heavy blue bloom; dots white, minute; cavity regular, acute, usually slightly russeted; stem medium; basin narrow, very shallow, corrugated, sometimes flat; calyx closed. Core closed, clasping; tube short, broad; stamens median, flesh greenish white, with green veins, good. Early winter.

"ANISIM GROUP.

Anisim; 14 M and 18 M of Budd; Zuzoff of Tuttle;



Anisim.

Good Peasant of Patten; Borsdorfer of Wragg; Peterson's Anisim; Swedish Borsdorf of Patten. This variety is proving very valuable in Minnesota and other parts of the Northwest, and has been grown in Wisconsin, Iowa and Minnesota under several different names as originally imported from Russia, but which now all give way to the name Anisim.

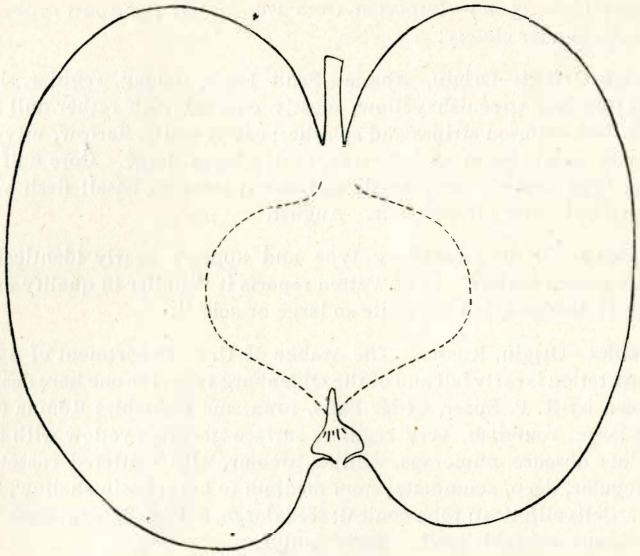
DESCRIPTION: *Anisim*—Size, 4½; form, roundish, inclining to conical; color, greenish ground nearly covered with a very dark red, with a bluish bloom with minute whitish dots; cavity, medium, slightly russeted, acute; stem, short, medium; basin, small, wrinkled, shallow; calyx, closed; flesh, white, fine grained, juicy; flavor, pleasant subacid; season, November to January; origin, Russia; tree, a prodigious bearer; young trees upright, spreading with age; limbs, long, slender, with a very strong shoulder; leaves, narrow, pointed, dark green.

N. E. Hansen: At the agricultural fair at Kiev, Russia, last fall, I saw the true Anisim exhibited under a Russian name meaning "Beauty." I met some of the leading Russian pomologists, who are endeavoring to correct the nomenclature of their apples.

A. G. Tuttle: I find the trees of the true Anisim are strongly shouldered, similar to those of my Rawle's Genet before they winter-killed. Anisim is one of the very best nursery trees grown.

C. Wedge: The shoulder in the Anisim limbs is very characteristic." (*Rus. Nom. Com.*)

Anisovka—Origin, Russia. Of the Oldenburg type and much resembling that variety. Season a few days earlier. Also called Anisette (No. 185).



Antonovka.
(No. 236)

Antonovka—Origin, Russia—The leading commercial apple of Southern Russia. Fruit desirable but tree blights in some localities. Fruit large, roundish, irregular, obscurely angular; surface yellow; dots minute, raised, white, suffused; cavity deep, regular, with radiating, often large patch of russet, stem medium; basin abrupt, corrugated or wavy; calyx closed. Core closed; cells ovate, slit; tube funnel-shaped; stamens median; seeds ten to sixteen, small, pointed, plump, a few imperfect; flesh yellow, juicy, sprightly spicy subacid, good. October.

"ANTONOVKA GROUP.

Antonovka; 16 M and 236; No. 224; Vargul, 277; German Calville, 324 (spurious); Russian Gravenstein, 105; Bergamot, 424.

DESCRIPTION: *Antonovka*—Size, 6 to 7; form, roundish, angular, flattened at the ends; color, straw yellow, with dots that give the skin a rough appearance; cavity, narrow, ridged, deep, russeted; stem, medium short; basin, medium deep, ridged; calyx, closed; flesh, yellow, nearly fine; core, nearly closed; flavor, pleasant, acid; season, October; origin, Russia.

J. Sexton: All the above appear alike to me, except No. 105, which is different in tree.

A. G. Tuttle: I do not think there is any difference in them.

J. B. Mitchell: I find Vargul, Bergamot and German Calville more valuable than Antonovka, although very similar." (*Rus. Nom. Com.*)

Aport (No. 23 M)—Imported from Russia—Of the Aport type and resembles Alexander closely.

Aport Orient—Origin, Russia—Fruit large, oblong, regular, slightly tapering; surface greenish yellow, mostly covered with rather dull mixed red with dark crimson stripes and splashes; cavity acute, narrow, wavy, russeted; stem short; basin abrupt, wavy; calyx open, large. Core half open, meeting; tube conical, very small and short; stamens basal; flesh yellow, coarse grained, mild subacid, fair. August.

Arabian—Of the Oldenburg type and appears nearly identical with that well known variety. C. G. Patten reports it "similar in quality and appearance to Duchess, but not quite so large or acid."

Arabka—Origin, Russia. The Arabka of U. S. Department of Agriculture importation is early fall and of the Oldenburg type; the one here described was grown by R. P. Speer, Cedar Falls, Iowa, and resembles Romna closely —Fruit large, roundish, very regular, surface greenish yellow with bronze blush; dots obscure, numerous, whitish, areolar, with scattered russet dots; cavity regular, deep, acuminate; stem medium to long; basin shallow, nearly smooth. Cells elliptical; tube conical; seeds large, flattened, long; flesh white, firm, pleasant, subacid, good. Early winter.

"ARABSKOE.

DESCRIPTION: *Arabskoe*—Arabskoe of Tuttle—Size, 6; form, round; color, green, overspread with dull purplish red, numerous white dots; cavity, small, deep; stem, short, stout; basin, broad, shallow, wrinkled, strongly pubescent; calyx, closed, small; flesh, white, coarse, loose; flavor, acid; season, winter; origin, Russia; tree blights badly with Mr. Patten."

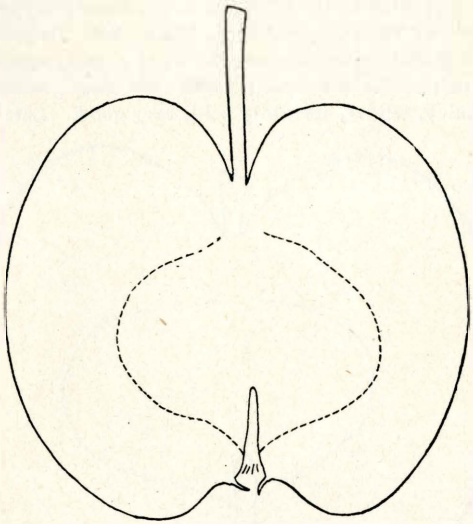
(*Rus. Nom. Com.*)

Arcad—Origin, Russia—Fruit small, roundish, flattened at ends, somewhat cylindrical; surface yellow with pale blush; dots distinct, numerous, yellow; cavity regular, deep, wide, with radiating russet; stem short; basin wide, deep, smooth; calyx open, segments erect convergent. Core sessile; cells ovate, entire; tube funnel-shaped; stamens median; seeds five, long, pointed, flattened; flesh white, juicy, sprightly subacid, good. Fall.

Arthur—Origin, Floyd Co., northern Iowa—Fruit below medium, oblong, truncated, somewhat irregular; surface yellow, mixed and splashed dull red on sunny side; dots minute, dark russet, numerous, distinct; cavity narrow, regular, acute, russet; stem long; basin abrupt, medium deep, wrinkled; calyx closed. Core closed; calyx tube long, narrow, open to core; stamens median; seeds packed tight in cells; flesh yellow, firm, fine grained, sprightly subacid, good. Winter.

Avista—Origin, Wisconsin—Fruit medium, oblong, conical, angular; surface unctuous, yellowish green with greenish streaks; dots white, minute, obscure; cavity wide, green, regular, often russeted, rather shallow; stem

long; basin shallow, wavy; calyx small, closed. Core closed; seeds plump; flesh white, very firm, fine grained, mild, pleasant subacid with sweet after taste, very good. Winter. The original tree is now growing on the farm of A. J. Philips, West Salem, Wisconsin.



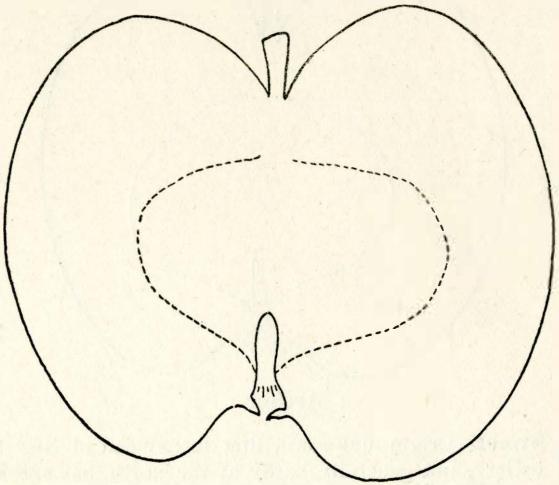
Arthur.

Bailey Sweet—Origin unknown, first introduced in New York. An old, choice variety, not generally hardy at the north, but specimens have been shown from the southern part of South Dakota at the state fair. The following description is from specimens grown at Freeburg, Minnesota—Fruit large, roundish oblong, somewhat conic, irregular; surface roughened by russet dots, greenish yellow, mostly covered with dark, rather dull red stripes, solid on sunny side; dots distinct, numerous, russet; cavity deep, narrow, regular, with a patch of russet; stem short; basin shallow, slightly corrugated, some fine wrinkles; calyx open, segments divergent. Core open; cells ovate; tube funnel-shaped; stamens median; seeds large, long, pointed, plump; flesh yellow, moderately juicy, firm, sweet, very good. Late fall, early winter.

Barker—Fruit medium, round, regular, somewhat tapering; surface waxen, yellowish white; dots obscure, numerous, minute, suffused, white; cavity acuminate, regular, wide, with stellate russet; stem short; basin shallow, corrugated; calyx closed, segments connivent. Core wide open; cells ovate, slit, large, roomy; tube funnel-shaped; stamens marginal; seeds small, plump; flesh snow white, fine grained, rather dry, acid; good for cooking. Fall. Specimens from M. D. L. Parsons, Algona, Iowa. Originated by Mrs. Barker, Story County, Iowa, from seed brought from New York, about 1870.

Several hundred seedlings were raised (about 11 miles west of Ames) but the orchard was badly wrecked by the root-killing winter of 1898-99.

Batullen—Origin, Russia—Fruit large, roundish, slightly conical; surface clear greenish yellow, overlaid with whitish, with carmine blush and russet net-veining; dots distinct, many, large, russet; cavity regular, deep, acute, with trace of russet; stem long; basin deep, irregular, corrugated; calyx closed; segments connivent, small. Core closed, meeting; cells ovate, slit; tube conical; stamens median; seeds very large, somewhat flattened; flesh whitish, juicy, tender, sprightly acid, very good. Late winter.



Beautiful Arcade.
(No. 453)

Beautiful Arcade—Origin, Russia—Fruit medium or above, oblong, truncated, angular; surface light yellow, splashed and mixed crimson on sunny side, roughened by the dots; dots numerous, green, obscure, raised above the surface; cavity slightly wavy, abrupt, a little brown around the stem; stem very short; basin regular, corrugated in bottom; calyx small, closed; core small, half open; tube long, funnel-shaped; stamens marginal; seeds rather large, long, pointed, flattened; flesh yellow, firm, fine grained, very rich and sweet, very good. September.

"BEAUTIFUL ARCADE.

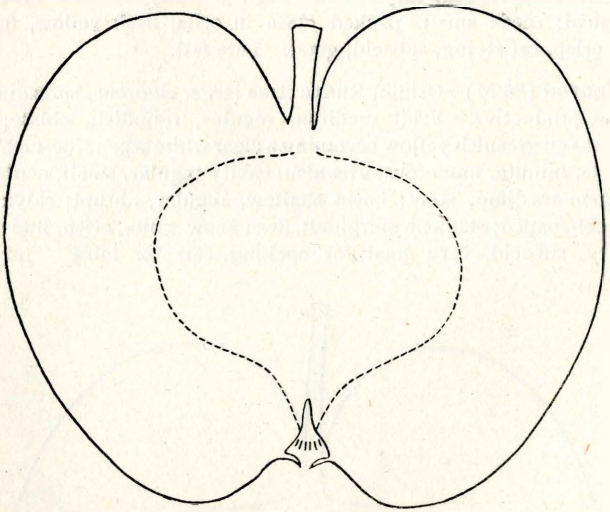
DESCRIPTION: *Beautiful Arcade*—Size, 6; form, oblong conical, angular; color, light yellow, clouded and splashed with red, often with surface roughened by raised dots; cavity, wide, deep, furrowed; stem, long; basin, shallow, rather abrupt, wrinkled; calyx, half open; flesh, dry, tender; flavor, good, sweet; season, August; origin, Russia; tree, irregular, spreading, open, good grower.

A. G. Tuttle: Beautiful Arcade blights a little on young trees, but not on old trees.

C. G. Patten: It shows much blight with me.

J. Sexton: It blights some at Ames." (*Rus. Nom. Com.*)

Bellerdovskoe—Origin, Russia—Fruit large, round, as regular as if turned in a lathe, somewhat truncated; surface smooth, greenish yellow, rarely a little bronzed in the sun; dots large, white, suffused, numerous; cavity regular, acute, with irregular patch of russet; stem short to medium; basin wide, shallow, corrugated around the calyx; calyx large, closed, segments generally small. Core regular, closed, outline distinctly defined; tube rather broad but very short; seeds plump; flesh white, firm, juicy, pleasant subacid. Quality good. Use, table or kitchen. Season, August.



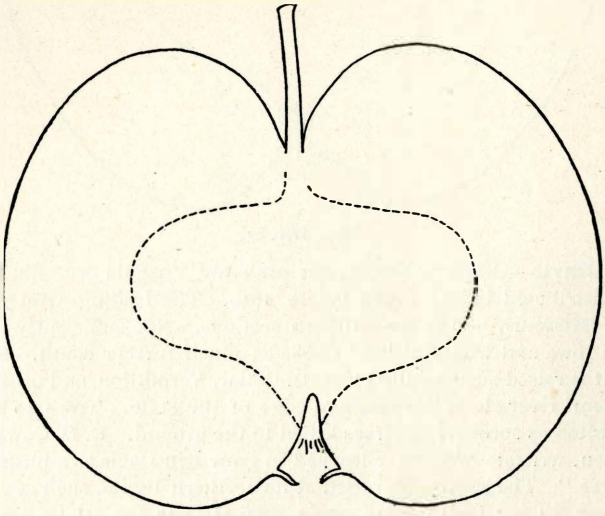
Ben Davis.

Ben Davis—Origin in doubt, but probably Virginia or Tennessee, and widely distributed in the south before 1850. The leading winter market apple of Missouri, and other southern sections. Not sufficiently hardy in northern Iowa and winter-killed in 1884-85 much further south. In South Dakota it is raised successfully by E. L. Collar, Vermillion, and others along the Missouri river along the southern edge of the state. Trees do best low-headed, often as sprouts from trees killed to the ground. E. D. Cowles, from Vermillion, writes: "We have learned to grow Ben Davis as a bush, instead of as a tree." The specimens raised at its northern limits, such as shown in cut (grown in northern Iowa), are somewhat less conical than southern-grown specimens, and decidely less inferior in size, color and quality; however, the deep abrupt basin is always present. Evidently a long growing season is necessary for this variety—Fruit large, roundish conical; surface yel-

low, nearly covered with bright red stripes and splashes, solid on sunny side; dots distinct, numerous, russet, some large; cavity obtuse, regular, deep, with radiating patch of russet; stem short; basin wide, nearly smooth, abrupt, deep; calyx open; segments divergent. Core closed; cells axile, obovate, entire, or nearly so; tube funnel-shaped; stamens median; seeds short, plump; flesh white, moderately juicy, mild subacid, fair to good only. All winter and spring.

Bergamot (No. 424)—Origin, Russia; resembles Antonovka closely and may be indentical with it—Fruit large, regular, oblong, cylindrical, truncated; surface with rich yellow with white bloom; dots minute, white, with large whitish bases, numerous; cavity regular, deep, acute, much russet, the russet often extending out in a large irregular patch; stem very short; basin deep, ribbed; calyx closed, segments large, erect. Core closed; tube conical; seeds small, packed close in cells; flesh yellow, firm, fine grained, crisp, satisfying, subacid, good. Late fall.

Bielgorod (86 M)—Origin, Russia; tree large, vigorous, spreading, open top, very productive.—Fruit medium, regular, roundish, oblate, surface smooth, waxen greenish yellow becoming a clear white when ripe, no blush nor stripe; dots, minute, numerous, greenish; cavity regular, small, acute, a little russet; stem medium, stout; basin shallow, regular, abrupt; calyx closed, tube funnel-shaped; stamens marginal; flesh snow white, crisp, fine grained, very juicy, subacid, very good for cooking, fair for table. July, early August.



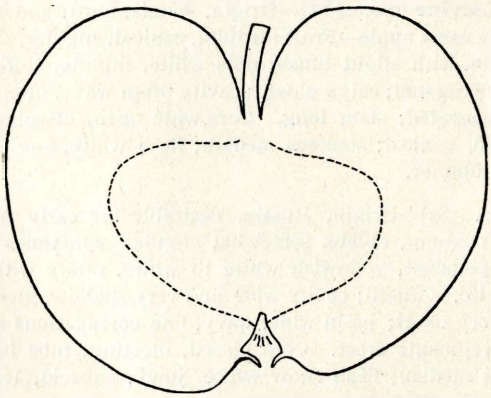
Black Annette.

Black Annette—An old variety brought from Marietta, Ohio, in 1866 by Aaron Plumley and largely grown for many years in Cedar and Muscatine

counties, Iowa. It does not seem to be the Black Annette of Downing as the fruit keeps till June or later.—Fruit medium, roundish oblate, regular; surface green, almost wholly covered with dark brownish red, with darker splashes, well colored specimens, black red with splashes mostly lost in the depth of coloring; dots very conspicuous, large, numerous, whitish and russet; cavity regular, obtuse, green and russet, stem medium to long; basin shallow, wide, smooth, sometimes leather-cracked; calyx open, segments erect convergent. Core closed, distant; cells round, nearly entire; tube funnel-shaped; stamens median; seeds short, plump; flesh white, mild, pleasant, subacid, very good. Season all winter and spring. Has been raised in northern Iowa, and merits attention.

Black Oxford—Origin, Maine—There esteemed for its long keeping and productiveness. At Cedar Falls, Iowa, it has done well top-grafted. Fruit medium, roundish oblate, slightly conical; surface yellow, nearly covered with dark solid brownish red, overlaid with gray net-veining; a peculiar color; dots numerous; conspicuous, light, a few large russets dots; cavity deep, russeted, the russet sometimes extending out over the base in large irregular patches; stem long, curved; basin shallow, wrinkled, somewhat leather-cracked; calyx open, segments erect convergent; core closed, outline irregular; cells ovate; tube funnel-shape; stamens median; flesh whitish, firm, moderately juicy, mild subacid, good. March to May.

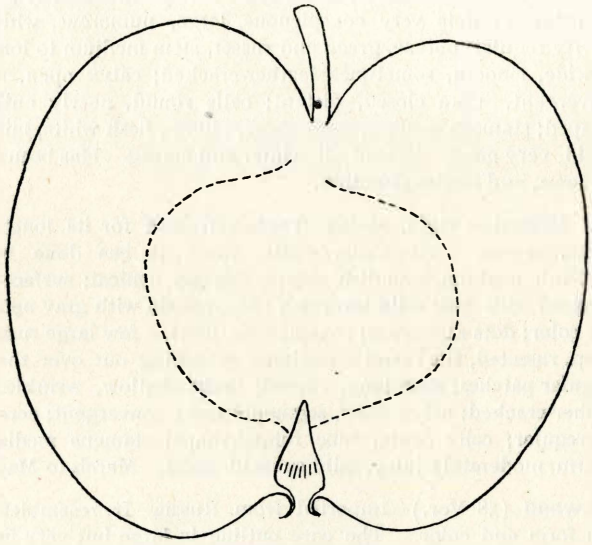
Blackwood (58 Vor.)—Imported from Russia—It resembles Anisim closely in form and color. The core outline is large but very indistinct. Seeds few, flat, very large; flesh pleasant, jucy, subacid. Season later than Anisim.



Blue Anis.

Blue Anis—Origin, Russia—Fruit small, roundish, tapering, angular; skin thin, semi-transparent; pale yellow to yellowish white, splashed with bright crimson on sunny side; dots very minute, white, obscure; cavity regular, acute, deep, narrow, with russet patch; stem short, touchiug a long

lower part of cavity; basin narrow, abrupt, rather shallow, corrugated and wrinkled; calyx closed; core half open, meeting; tube conical; stamens median; flesh white, juicy, fine grained, pleasant subacid, good. Fall.



Blushed Calville.
(No. 22 M)

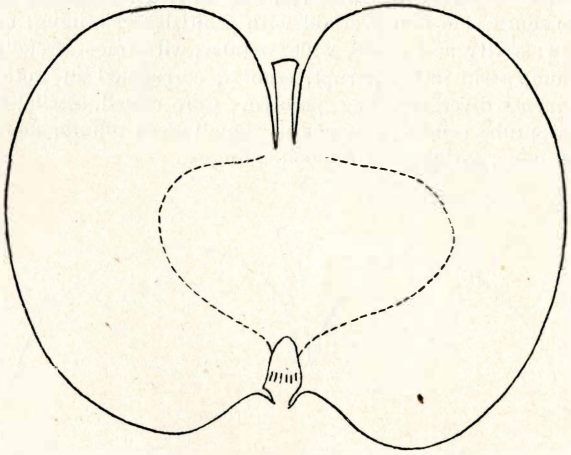
Blushed Calville (No. 22 M)—Origin, Russia; hardy and desirable at the North as a very early apple—Fruit medium, conical, angular, ribbed; surface yellowish white, with slight blush; dots white, minute, suffused, obscure; basin broad, corrugated; calyx closed; cavity often wavy, often green, sometimes slightly russeted; stem long. Core wide open, clasping; cells large, slit; tube broad, conical; stamens median; flesh white, fine grained, juicy, good. Early summer.

Bode (No. 385)—Origin, Russia, desirable for early summer at the North—Fruit medium, oblate, somewhat angular, sometimes unequal; surface smooth, polished, yellowish white to white, rarely with faint blush; dots large, white, suffused; cavity wide and very shallow, green and russet; stem thick, very short; basin wide, wavy, fine corrugations about the eye; calyx closed, segments erect. Core closed, meeting; tube broad but very short; stamens median; flesh snow white, juicy, subacid, tender, good to very good. Early August.

"BODE.

DESCRIPTION: *Bode*—Size, 4; form, oblate, slightly oblique, a trifle angular; color, greenish white, cavity russeted often over-running light dots; cavity, rather small, medium deep; stem, short; basin, broad, medium deep,

wrinkled, wavy; calyx, half open, erect; flesh, white, firm, medium fine; flavor, acid; season, summer." (*Rus. Nom. Com.*)



Bode.
(No. 385)

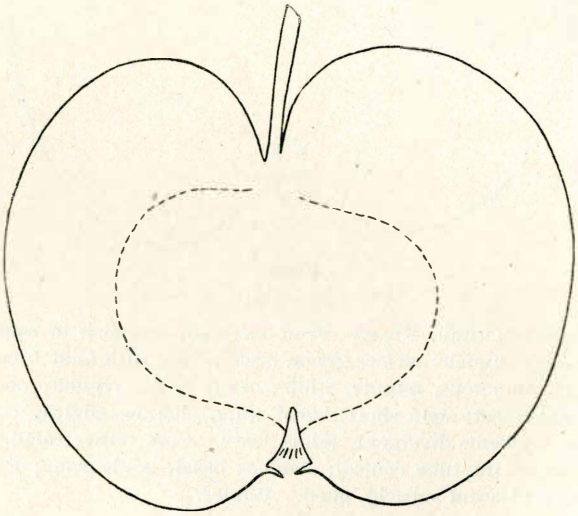
Bogdanoff—Origin, Russia—Fruit medium, roundish to roundish oblong, obscurely angular; surface green, occasionally with faint bronze blush; dots obscure, numerous, minute, white; cavity wide, regular, obtuse with slight stellate russet; stem short; basin wide, shallow, slightly corrugated; calyx open, segments divergent, large, leafy. Core rather small, meeting; cells obovate, entire; tube conical; stamens basal; seeds many; flesh white, juicy, tender, pleasant subacid, good. Winter.

Boiken—Named after Dike-warden Boike of Germany—Fruit medium, oblate conical; surface smooth, clear yellow, sometimes with blush; dots very obscure, many, minute, white; cavity wide, regular, deep, obtuse, with radiating russet; stem long; basin wide, medium deep, wrinkled; calyx open or closed. Core open; cells round; tube conical; stamens median; seeds short, round, few; flesh white, firm, juicy, fine grained, sprightly, refreshing subacid, very good. Winter.

Bon Homme *County*—Origin, Bon Homme County, South Dakota—Fruit medium, roundish oblate, slightly angular toward base; surface dark green, overspread with thin, grayish, obscure net-veining; dots distinct, numerous, large, gray, some few russet with gray bases; cavity acuminate, regular, with stellate russet; stem long; basin shallow, wide, smooth; calyx closed, segments connivent. Core open, sessile; cells abaxile, ovate, slit; tube conical; stamens marginal; flesh white, acid, good. Winter.

Borovinka—Origin, Russia; as grown in the Northwest this variety very closely resembles Oldenburg, but the question of their identity has not

been settled. Some growers prefer the Borovinka as an improved Oldenburg—Fruit medium, roundish, truncated, regular; surface greenish yellow, mostly covered with stripes and splashes of dark crimson, mixed and marbled on sunny side and overlaid with whitish net-veining; dots white, obscure, few; cavity acuminate, wide, regular, with trace of stellate russet; stem medium; basin rather abrupt, regular, corrugated in bottom; calyx closed, segments divergent, long, pointed. Core closed, sessile; cells axile, round, entire; tube conical; stamens marginal; seeds plump, sharp pointed; flesh white, juicy, sprightly acid, good. August.



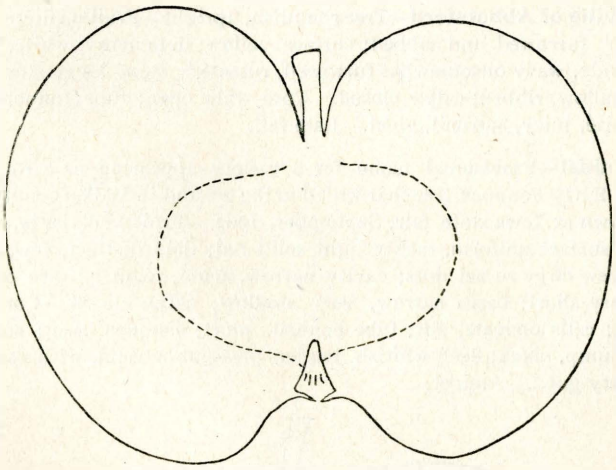
Bon Homme County.

Borsdorf—Origin, Germany; trees received from Russia—Fruit medium or above, roundish, truncated, unequal; surface light green, sparsely striped and splashed red, with mixed red on sunny side; dots minute, white; cavity acuminate, usually with shallow green furrows extending out from the stem; stem short, thick; basin narrow, shallow, regular, usually with faint wrinkles; calyx closed. Core wide open; seeds numerous, 13 to 19; flesh white, juicy, fine grained, tender, mild, pleasant subacid, good to very good. Use table. Winter.

Breskovka (No. 152 M)—Origin, Russia; a hardy variety of the Yellow Transparent type. Tree productive, with somewhat spreading top—Fruit medium, roundish, regular, often somewhat ribbed toward the calyx; surface smooth, waxen, transparent, clear greenish yellow, becoming a clear white when ripe; no blush nor stripe; dots greenish, minute, numerous, suffused in the transparent skin; cavity regular, acute, with a little russet; stem quite long; basin shallow, regular, usually fine wrinkles around the eye; calyx

closed. Core closed; flesh snow white, crisp, fine grained, very juicy, subacid, very good. July and early August.

Breskovka much resembles Bielgorod (No. 86 M), which is identical with Resonant (No. 352), but the stem of Breskovka averages much longer; the fruit is somewhat ribbed, the basin averages wider and shallower; and the cavity is wider.



Brett.

Brett—Origin, Minnesota—Fruit large, roundish, regular, truncated; surface yellow, with dark crimson stripes on sunny side; dots white, minute, obscure; cavity deep, regular; stem short; basin wide, regular, abrupt, often finely wrinkled; calyx closed. Core closed, clasping; tube conical; stamens median; flesh white, juicy, sprightly subacid, good. Early winter.

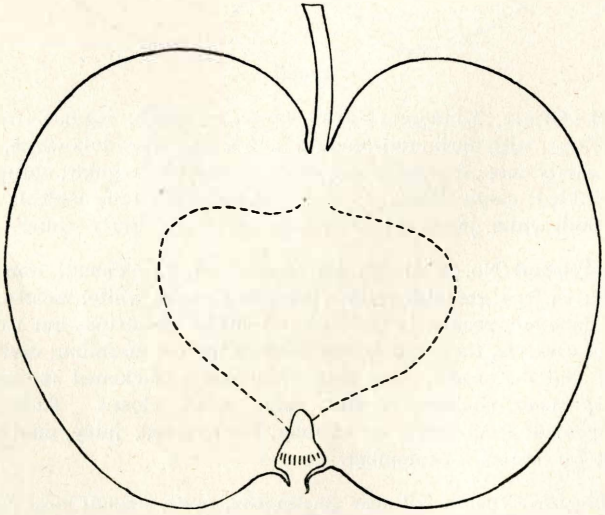
Broad Green (No. 68 M)—Origin, Russia—Fruit very small, round, regular, oblate; surface greenish yellow, becoming waxen white, mostly covered with fine dark red, peculiarly marbled and mixed, no stripes but a very few splashes of carmine, the white shows through the red marbling; cavity regular, wide, shallow, brown; stem long, often much thickened at lower end, basin very small, shallow, regular; calyx small, closed. Tube conical; stamens median; flesh white, very tender, fine grained, juicy, mild subacid. Excellent for dessert. September.

Burlington—Originated near Burlington, Iowa, a small local variety of excellent quality—Fruit small, regular, roundish, truncated, cylindrical; surface greenish yellow, with a shade of pale red on sunny side; dots whitish, many, with dark dot in centre; cavity wide, shallow, regular; stem short; basin wide, deep, folded; calyx closed. Core small; flesh yellow, tender, mild subacid, rich, very good. Winter.

Burlovka (No. 183)—Origin, Russia—Fruit medium, oblate, often somewhat angular and furrowed; surface polished, yellow, often with bronze blush; dots greenish white, obscure, numerous, suffused; cavity wide, regular, with a little russet; stem long; basin rather shallow, slightly corrugated; calyx small, long, closed. Core regular, closed, clasping; tube long, conical; stamens marginal; seeds small, short, plump; flesh white, fine grained, juicy, subacid, good. Last of July and August.

Calville of Abbotsford—Tree roundish, upright—Fruit medium, oblate, irregular, furrowed and ribbed; surface yellow; dots many, white, minute; cavity wide, wavy or somewhat furrowed, russeted; stem long, stout; basin wide, shallow, ribbed; calyx closed. Core wide open; tube funnel-shaped; flesh white, juicy, subacid, good. Late fall.

Cardinal—Provisional name for a variety appearing as a root-sprout from an Early Pennock tree that killed to the ground in Dallas county, Iowa; fruit shown at Iowa state fair, September, 1902.—Fruit very large, regular, conical; surface uniform, rather light solid red; dots distinct, few, minute, gray, a few large russet dots; cavity narrow, acute, regular, trace of russet; stem very short; basin narrow, very shallow; calyx closed. Core small, meeting; cells obovate, slit; tube conical, short; stamens basal; seeds ten, short, plump, black; flesh whitish, tender, pleasant subacid, with sweet after taste, very good. August.

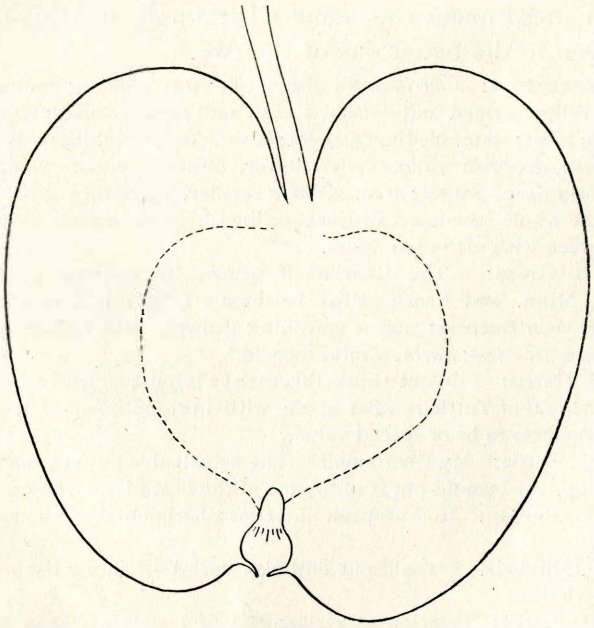


Catherine.

Catherine—Origin, Minnesota—Fruit medium or above, roundish oblate, regular; surface a rich golden yellow, with faint blush; dots white, minute, suffused; cavity wide, regular; stem long; basin wide, shallow, minutely

wrinkled; calyx open. Core open, clasping; tube funnel-shaped; stamens marginal; flesh white, juicy, subacid, fair. Early fall.

Cellini—Origin, England; tree subject to blight and lacking in hardiness—Fruit large, form very regular, roundish conical, somewhat truncated; surface dull greenish yellow, mostly covered with mixed and marbled red, with broken splashes of darker red, some whitish net-veining; dots obscure, white, minute; cavity wide, regular, russet extends out in a large patch; stem medium; basin wide, regular, shallow; calyx wide open to the core, segments short, with a distinct interval between each and flat converging but not meeting. Core open; cells very small, roundish or oblate; tube conical or funnel-shaped; stamens median or basal; seeds very few, plump; flesh fine grained, tender, white, juicy, sprightly subacid, very good for culinary use. October.



Charlamoff.

Charlamoff (*Pointed Pipka, Peterson's Charlamoff*)—Origin, Russia. One of the four varieties recommended by the Minnesota State Horticultural Society as of the first degree of hardiness. Tree spreading, vigorous, productive—Fruit above medium to large, oblong, somewhat truncated, occasionally roundish truncated, angular, ribbed, especially about the stem; surface light yellow, covered with dark crimson stripes and splashes, mixed red on sunny side, with a heavy blue bloom; dots white, minute, obscure; cavity deep, acute, ribbed, with small radiating patch of russet; stem medi-

um to long; basin wide, shallow, corrugated; calyx closed, segments large. Core closed; tube funnel-shaped; stamens median; flesh white, fine grained, pleasant acid, often slightly stained with red next to skin, good. August.

"CHARLAMOFF GROUP.

Charlamoff, 262; Peterson's Charlamoff; Champanskoe; Pointed Pipka, 361; Champagne, 112 M. This Charlamoff is entirely distinct from the Charlamoff as grown by J. B. Mitchell and A. G. Tuttle, which is a flat apple of upright habit of tree, and not as valuable as many more of the same season. The Charlamoff of Mitchell and Tuttle it was decided to name Schroeder. In other words, two varieties have been imported under the name Charlamoff, and this name is now given to the better one of the two.

DESCRIPTION: *Charlamoff*—Size, 5 to 6; form, oblong conical; color, greenish yellow striped and splashed with red; cavity, medium deep, often with large lobes; stem, medium slender; basin, deep, wrinkled; calyx, nearly closed; flesh, greenish white, tender; flavor, pleasant, vinous acid; season, September; origin, Russia; tree, strong, regular, spreading grower, thick topped; the whole tree has a distinct yellowish green aspect; leaves, large, lightish green with many red veins.

S. B. Green: The Charlamoff grown by Andrew Peterson, of Waconia, Minn., and hence called Peterson's Charlamoff, is generally a little later than Duchess; tree a spreading grower, with foliage and bark lighter than Duchess; flavor, a mild subacid.

J. S. Harris: I do not think this variety is quite as hardy as Duchess. The Charlamoff of Tuttle is a flat apple, with upright habit of tree, and is too near Duchess to be of special value.

A. G. Tuttle: My Charlamoff is not as valuable as many more of the same season, yet I would put it in my list of the best fifty varieties.

N. E. Hansen: In European nurseries Charlamofsky is a synonym of Duchess.

J. B. Mitchell: I would put Tuttle's Charlamoff in my list of the best sixteen varieties.

C. G. Patten: Peterson's Charlamoff I find makes a large, spreading tree, and bears reasonably young.

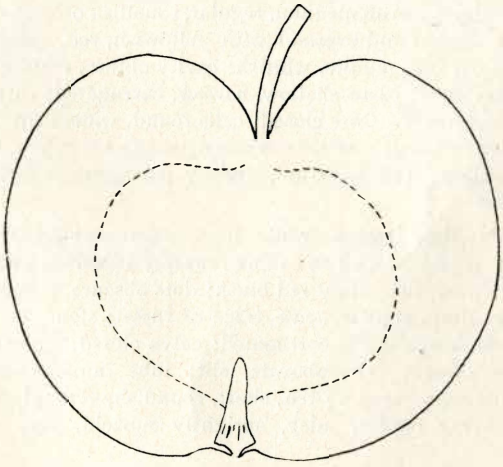
S. B. Green: It might avoid confusion to name Peterson's Charlamoff Champagne." (*Rus. Nom. Com.*)

Charlottenthaler—Origin, Russia; a very early variety of the Yellow Transparent type—Fruit medium, roundish conic, very irregular, angular; surface polished, pale yellowish white, waxen, thinly striped red on sunny side; cavity obtuse; stem long; basin shallow, abrupt, few minute wrinkles; calyx small, closed, segments connivent. Cells round, entire; tube conical;

stamens median; flesh white, juicy, subacid, good. Early August. Specimens from F. J. Peterson, Waconia, Minn.

Chenango (*Chenango Strawberry*, *Sherwood's Favorite*)—Origin, Lebanon, New York. Tree vigorous, spreading, fruit a great favorite for dessert wherever grown—Fruit medium to large, oblong conic, regular, truncated, obscurely ribbed; surface yellowish white, mostly covered with rosy crimson stripes, mixed on sunny side, and in part thinly overlaid with whitish netveining; dots distinct, white, few, minute; cavity regular, acute, narrow, somewhat uneven; stem very short; small; basin narrow, shallow, nearly or quite smooth; calyx closed or half open, segments erect convergent. Core rather large, half open; cells elliptical, entire; tube funnel-shaped; stamens basal; seeds flat, pointed; flesh white, tender, juicy, mild, pleasant subacid, very good. September, October. Not sufficiently hardy at the north.

Chisman—A seedling of Yellow Bellflower, from Dallas County, Iowa, introduced by John Wragg & Sons, Waukee, Iowa—Fruit medium to large, oblong, angular, ribbed; surface yellow; dots distinct, numerous, russet; cavity regular, with trace of russet; stem medium; basin narrow, ribbed, rather shallow; calyx closed, segments connivent. Core closed; cells ovate, widely slit; tube conical; stamens median; seeds few, plump, short; flesh juicy, pleasant, spicy subacid, very good. Winter.



Christmas.

Christmas (No. 310)—Origin, Russia. It is doing well in Minnesota—Fruit medium, roundish conical to oblong oval, sometimes obscurely threesided, often oblique; surface yellow, with bright crimson stripes and splashes on sunny side, often nearly covering the whole surface, then a beautiful fruit; cavity narrow, acute, with a little russet; stem long; basin flat or nearly so, with ribs, wrinkles and protuberances around the eye; calyx

closed. Flesh white, juicy, tender, subacid, very good. Late fall. See Sumnoi, Calville and Crooked Spike.

"CHRISTMAS GROUP.

No. 310. The variety grown under the number 310 by Mitchell, Peterson, Green and others, was decided to be the true Christmas.

DESCRIPTION: *Christmas*—Size, 11; form, round, conical, often oblique and slightly angular; color, yellow with red stripes at base and deep clear red towards the eye; cavity, medium, rather narrow; stem, medium; calyx, closed on a flush wrinkled or narrow ribbed surface; flesh, white, fine grained; flavor, pleasant acid; season, December; origin, Russia." (*Rus. Nom. Com.*)

Cinnamon Pine (No. 375)—Origin, Russia—Fruit small, roundish oblate, obscurely angular; surface yellow, mostly covered with numerous dark crimson stripes and splashes; dots obscure, few, minute, whitish; cavity narrow, acute, trace of russet; stem medium; basin shallow, wrinkled; calyx closed, segments divergent, long. Core closed; cells ovate, entire; tube funnel-shaped; stamens median; seeds ten, plump, short, rounded; flesh white, juicy, subacid, good. September.

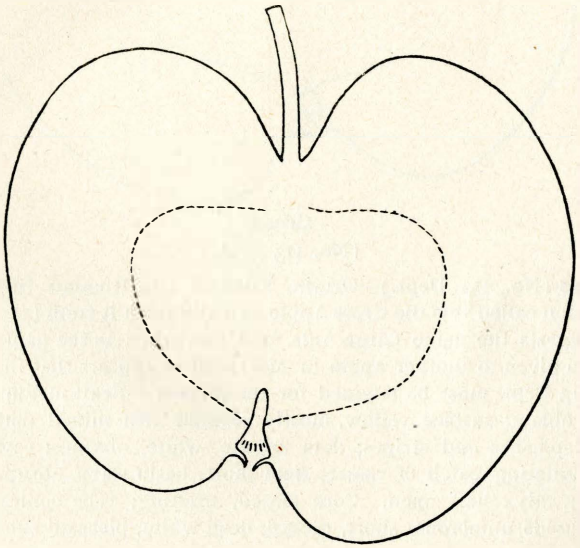
Clark's Orange—Specimens from William Oxford; tree blights, and is lacking in hardiness—Fruit medium, regular, roundish oblong, conic; surface yellow, thinly shaded and overlaid with yellowish, red, sparsely splashed; dots very obscure, few, minute, whitish; cavity obtuse, regular, a little radiate russet; stem short; basin shallow, narrow, corrugated; calyx open, segments erect convergent. Core closed; cells round, widely slit; tube conical; stamens median or basal; seeds about seven, mostly shrunken, long, slender, flesh orange yellow, crabby texture, slightly astringent, subacid, fair. September, October.

Clark's Prolific—Origin, Albia, Iowa, originated by W. G. Clark—Fruit medium, regular, roundish conical, sharply tapering; surface polished, clear waxen yellow, with bright red blush; dots obscure, numerous, minute, whitish; cavity deep, regular, acute, trace of russet; stem short; basin narrow, abrupt, shallow, slightly corrugated; calyx closed, segments erect convergent. Core closed; cells obovate, slit; tube funnel-shaped; stamens marginal; seeds from seven to ten, short, roundish, very plump; flesh yellowish white, very tender, juicy, sprightly subacid, very good. Early winter.

Clines Seedling—Origin, Minnesota—Fruit medium; oblong conical, oblique, angular (obscurely five-sided); surface light green, thinly covered with scattered dark red splashes and stripes, especially on sunny side; dots white, minute, obscure; cavity acute, narrow, regular, with russet sometimes extending out in a large radiating patch; stem medium; basin narrow, very abrupt, with fine wrinkles; calyx open, segments long. Core closed, clasping; tube funnel-shaped, long, narrow; stamens marginal; flesh white, moderately juicy, firm, subacid, fair. Late winter.

Colman—A cross of Jonathan with Northern Spy pollen, originated by A. F. Colman, Corning, Iowa; 1902 was the third year of bearing; tree productive—Fruit large, round, somewhat truncated; surface waxen yellow, thinly striped and splashed bright red, mixed on sunny side; dots minute, white, obscure, few; cavity deep, narrow, regular, acuminate, with small stellate russet patch; stem very short; basin smooth, cup-shaped, narrow; calyx closed, segments flat convergent. Core closed; cells ovate, slit; tube conical; stamens median; seeds numerous, plump; flesh white, juicy, quality excellent, worthy of its parents. Early winter. A promising variety for dessert and market, where the parent varieties are hardy.

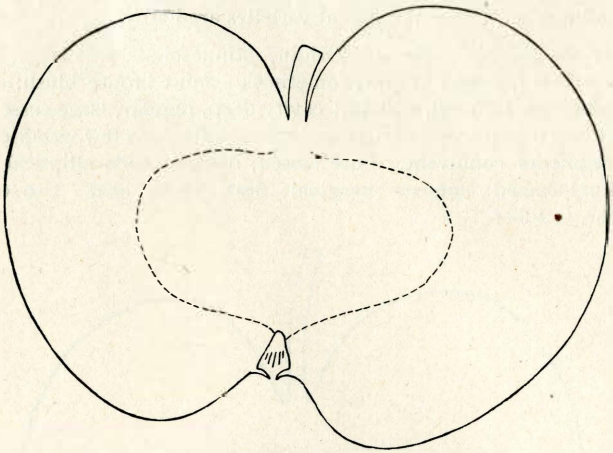
Cotterals *Seedling* (No. 1)—Origin, Minnesota—Fruit large, oblong, regular; surface greenish yellow, sometimes a faint bronze blush; dots obscure, numerous, suffused, whitish; cavity deep, regular, large russet patch; stem very short; basin very abrupt, smooth, sometimes a few wrinkles; calyx closed, segments connivent. Core closed, distant; cells elliptical, entire; tube funnel-shaped; stamens marginal; flesh white, acid. Use cooking. September, October.



Cresco.

Cresco—Originated by J. B. Mitchell, Cresco, northern Iowa—Fruit medium, roundish oval, regular; surface light yellow, with blush or warm cheek; dots minute, white, suffused, obscure; cavity deep, acute, narrow, with radiating patch of russet; stem long, slender; basin wavy, corrugated, abrupt; calyx closed, segments large. Core closed, outline indistinct; cells ovate, slit; tube long, funnel-shaped; stamens marginal; seeds short, plump; flesh white, pleasant subacid, good. October or later.

Crooked Spike (No. 159 M)—Origin, Russia; this appears identical with Christmas, Sumnoi Calville and 136 M.—Fruit medium, oblong conical, often pointed; surface greenish yellow, covered with a thin whitish net-veining, on sunny side splashed and striped dull red, unctuous at full maturity; dots few, obscure, whitish; cavity wide, shallow; stem long, stout; basin flat, with many raised prominences and corrugations around the eye; calyx closed. Core open; cells roomy, round; tube conical; stamens marginal; seeds large; flesh snowwhite, firm, juicy, rich, subacid, very good. Table or kitchen. September and later.



Cross.
(No. 413 Dept.)

Cross (No. 413 Dept.)—Origin, Russia. The Russian Nomenclature Commission called this the Cross Apple to distinguish it from (15 M.) Prof. Budd suggests the name Large Anis for Cross 413. As the name Cross has long been given to another apple in Maryland it appears that the Numbers 15 and 413 Dept. must be retained for the present.—Fruit medium to large, regular, oblate; surface yellow, mostly covered with mixed dark red and crimson splashes and stripes; dots minute, white, obscure; cavity regular with a radiating patch of russet; stem short; basin wavy, abrupt, with fine wrinkles; calyx half open. Core closed, meeting; tube conical; stamens median; seeds numerous, short, plump; flesh white, pleasant subacid, good. Late fall.

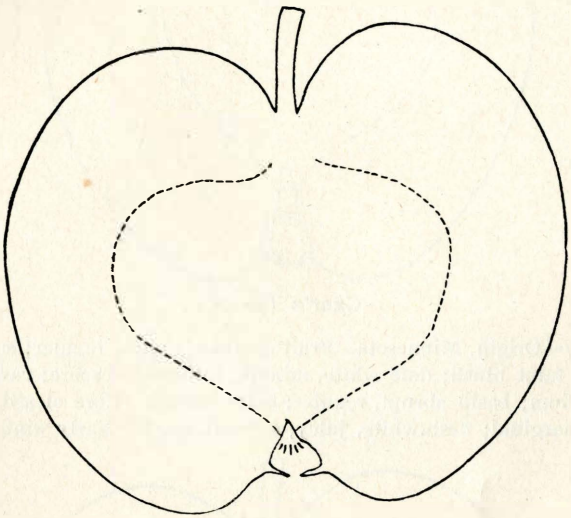
"CROSS GROUP.

413 Department. The name Cross was adopted as the official name of the No. 413 of the United States Department, which has also been disseminated under the name of Large Anis. It is distinct from Cross 15 M, 8 M, Skrischapfel and Cross Vor., the synonomy of which was not taken up.

DESCRIPTION: *Cross*—(No. 413 Dept.)—Size, 5; form, oblate conical; color, greenish yellow, nearly covered with a light carmine, dotted with green specks, with distinct bloom; cavity, green, broad, deep; stem, medium; basin, well defined, nearly smooth; calyx, large, closed; flesh, light yellow; flavor, slightly subacid; season, October to December; origin, Russia; tree very spreading, medium grower; wood, grayish.

A. G. Tuttle: No. 413 Dept. does not blight a particle with me. Chas. Gibbs sent me the scions. Mr. Gibbs visited me once and looked through my collection. He said I had nearly everything, but should have one or two more, so he sent me Cross and Grandmother."

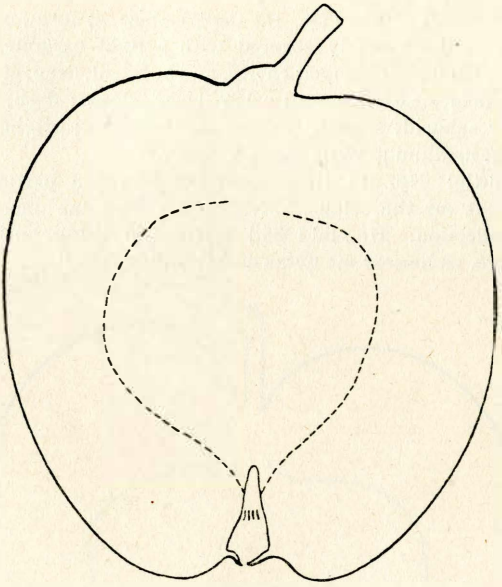
(*Rus. Nom. Com.*)



Cross.
(No. 15 M)

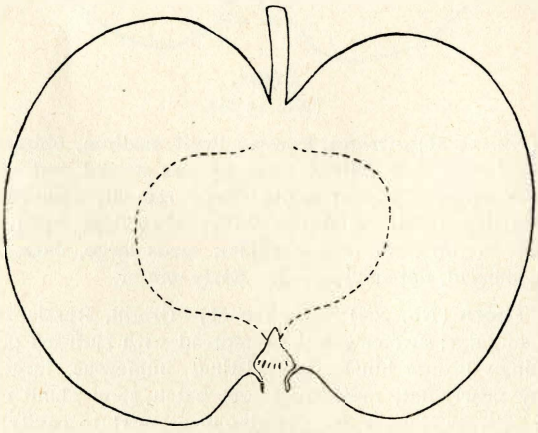
Cross (No. 15 M)—Origin, Russia—Fruit medium, oblate, regular or nearly so; surface a rich yellow, more or less striped and splashed with crimson; dots white, obscure; cavity deep, regular, somewhat russeted; stem medium; basin shallow, abrupt, wavy; calyx large, open. Core open, clasping; tube conical; stamens marginal; seeds large, dark brown; flesh white, brisk subacid, not spicy, good. Early winter.

Czar's Thorn (No. 206); (No. 140 M)—Origin, Russia—Fruit large, long, conic, angular; surface green, overspread with suffused gray net veinings, sometimes bronze blush; dots distinct, numerous, large, white, suffused; cavity nearly flat, radiating russet patch; stem about one-half inch long, stout, with peculiar fleshy protuberances next to cavity; basin very shallow, irregular, narrow, fine wrinkles. Core wide open, distant; cells elliptical, abaxile, slit; tube funnel-shaped; stamens median; seeds short, plump; flesh rather dry, sweet, fair. September.



Czar's Thorn.

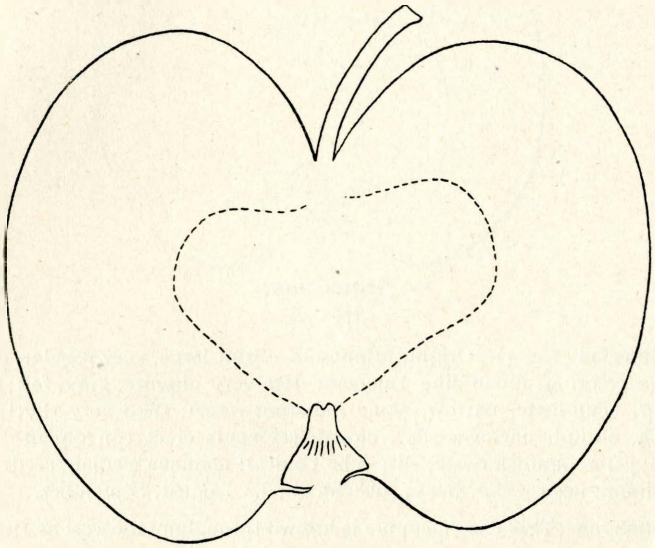
Daisy—Origin, Minnesota—Fruit medium, oblate, regular; surface yellow, with faint blush; dots white, minute, suffused, obscure; cavity acute; stem medium; basin abrupt, regular; calyx closed. Core closed, meeting; stamens marginal; flesh white, juicy, subacid, good. Early winter.



Daisy.

Dansic Pipka (No. 25 M)—Origin, Russia—Fruit large, roundish oblong, somewhat conical, truncated; surface unctuous, green, often with bronze cheek;

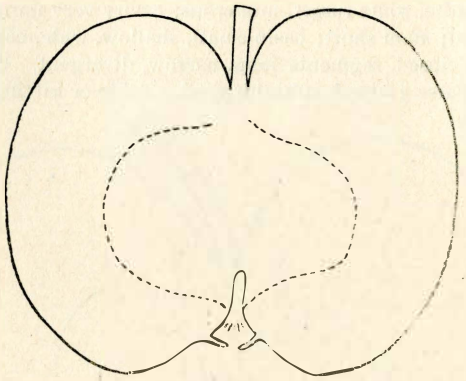
dots minute, white, some russet, numerous; cavity very narrow, deep, acute, slightly russeted; stem short; basin small, shallow, wide, corrugated around the eye; calyx closed, segments long, narrow, divergent. Core open; flesh white, juicy, coarse grained, subacid, good. Table or kitchen. Late fall.



Deoma.

Deoma—Origin, Minnesota. J. S. Harris said, in December, 1901, "I think better of this apple than formerly."—Fruit large, very regular, round, slightly truncated; surface smooth, yellow, bronze blush; dots large, obscure, few, white, some with minute russet centres, suffused; cavity regular, deep, obtuse, wide, slightly russeted; stem medium, stout; basin wide, somewhat corrugated and wavy; calyx open, segments divergent, sometimes erect. Core open, meeting; cells ovate, slit; tube wide, funnel-shaped; stamens basal; seeds seventeen, short, plump; flesh white, juicy, sprightly, brisk subacid, good. Chiefly culinary. Winter.

Ditus Day (No. 2)—Originated by Ditus Day, Farmington, Minnesota. Mr. Day has repeatedly shown the fruit of two years, in good condition, side by side at the Minnesota State Fair. Mr. Day said, in September 1898: "I bought a Saxton in the 70's, it killed down in 1884-85; one half sprouted up and bore Saxtons, the other was this seedling, which I have numbered No. 2. I now have one year old seedlings of it."—Fruit small, roundish, regular, truncated; surface green, with dull red streaked cheek, nearly solid red, with obscure streaks on sunny side; dots very minute, white, obscure; cavity wide, regular, obtuse, with patch (generally large) of radiating russet; stem medium to long; basin wide, shallow, with fine wrinkles. Core closed, clasping; tube long, funnel-shaped; stamens marginal; flesh white, pleasant subacid, good. Late winter and spring.



Ditus Day.
(No. 2)

Douglas (No. 3)—Origin, Minnesota—Fruit large, very regular, oblate; surface coloring, much like Duchess; dots very obscure, gray, few; cavity regular, acuminate, narrow, some radiating russet; stem very short; basin smooth, abrupt, narrow; calyx closed, segments erect convergent. Core closed; cells roundish ovate, slit; tube conical; stamens median; seeds about ten, plump; flesh white, juicy, subacid, good. August, September.

Duchess—This Russian apple is known throughout the west as Duchess, the full name is Duchess of Oldenburg; the American Pomological Society has abbreviated the name to Oldenburg, but this name has not been generally accepted by western fruit growers. In European nurseries it is propagated under the name of Charlamowsky and Borowitsky. It was early imported into the west coming to us by way of England and it was the extreme hardiness of this variety in the early test winters that kept up the hopes of prairie orchardists in time of great discouragement and led to the importations of more varieties from Russia. For cut see frontispiece and for description see Oldenburg.

"DUCHESS GROUP.

Duchess; Duchess of Oldenburg; Oldenburg; Arabian, 184; Borovinka, 245; White Krim; Anisovka or Anisette, 185; Glass Green.

DESCRIPTION: *Duchess*—Size, 6; form, roundish oblate; color, greenish yellow with red stripes; cavity, regular, medium deep, narrow, light russeted; stem, medium; basin, broad, corrugated; calyx, half open; flesh, light yellow, rather coarse; core, medium, closed; flavor, rather sharp acid; season, August; origin, Russia; tree, medium upright.

A. G. Tuttle: My Glass Green colors up more than Duchess, and keeps its flavor longer than Duchess after coloring. It is a better apple in my experience to grow than Duchess. Of late years I have set Glass Green

instead of Duchess, as it is a better tree, and more valuable because keeping its quality longer after coloring.

C. G. Patten: The Anisovka I got from Dr. Regel is distinctly of the Anis family and of very upright habit. Peterson of Waconia and Reeves of Waverly say that Borovinka is better than Duchess.

S. B. Green: That is J. M. Underwood's opinion.

C. Wedge: Mr. Peterson said his Borovinka was a better keeper, but his Duchess were old decrepit trees, while his Borovinka were young trees." (*Rus. Nom. Com.*)

Duchess (**No. 8**)—Originated by C. G. Patten, Charles City, Iowa—Fruit medium to large, regular, often unequal; surface greenish yellow with bronze blush; dots obscure, numerous, minute, white; cavity deep, wide, obtuse, regular, some stellate russet; stem short; basin abrupt, somewhat wrinkled and minutely folded; calyx half open, segments erect convergent. Core open, small, outline greenish yellow, sharply defined; cells ovate; tube conical; stamens median; seeds large, long, few; flesh yellow, with greenish yellow veins near core, firm, sharp subacid, good. Culinary. Late fall.

Duchess X Iowa Keeper—A crossbred seedling originated about 1888, at the Iowa Experiment Station and shown at Iowa State Fair in 1900 and 1902—Fruit medium, round, truncated, very regular; surface greenish yellow, with faint bronze blush; dots minute, obscure; cavity wide, regular, obtuse, a faint trace of russet; stem short; basin wide, shallow; slightly wrinkled, segments connivent. Core closed, barely clasping; cells ovate, slit; tube conical; stamens median; seeds ten, large, plump; flesh white, juicy, subacid, good. Probably early winter.

Dudley *Winter* (*North Star*)—A bright colored seedling of Oldenburg, originated by J. W. Dudley, Aroostook County, Maine, and sent out under the name of North Star by a Rochester nursery, but this name is already occupied—Fruit large, regular, roundish oblate; surface smooth, yellow, mostly covered with bright rosy crimson stripes and splashes, coloring nearly solid on sunny side, with thin bluish bloom; cavity regular, wide, obtuse, with trace of stellate russet; stem long; basin deep, abrupt, corrugated and ribbed; calyx closed, segments erect convergent. Core closed; cells round, widely slit; tube conical, rather urn-shaped; stamens median; seeds plump, pointed; flesh yellow, white inside the core outline, fine grained, pleasant subacid, very good. Late fall and early winter.

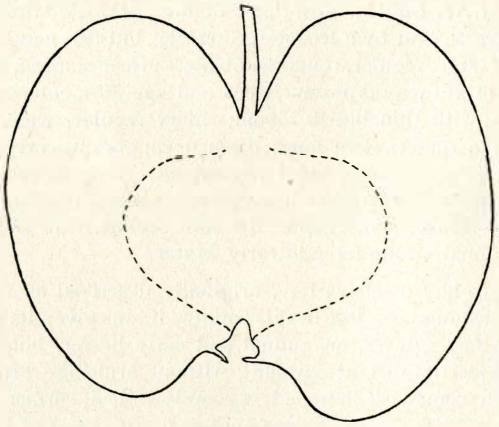
Dyer—An old French variety, originally described as Pomme Royal, but the name having been lost in this country it was given its present name. The tree is a fair grower, an annual and early bearer, but the thin skin of the fruit prevents distant shipping without bruising—Fruit medium to large, roundish, somewhat flattened, obscurely ribbed; surface smooth, clear greenish yellow, with rarely a faint blush and with more or less thin russet net-veining; cavity regular, deep; stem medium; basin medium, abrupt, ribbed; calyx closed, segments long, divergent. Core open, round; tube funnel-shaped; stamens median; seeds many, small; flesh yellowish white,

spicy, very tender and juicy, rich aromatic, sprightly subacid, quality excellent to best, having but few equals. October to September. Not hardy north, but a few have been raised in northern Iowa by top-grafting on hardy stocks.

Early Champagne (No. 68)—Origin, Russia—Fruit below medium, roundish oblate; surface light yellow almost or wholly covered with nearly solid dark crimson splashes and stripes, marbled and mixed; dots minute, white, obscure; cavity regular, acute, russeted; stem stout, medium to long; basin rather shallow, corrugated; calyx half open. Core closed, meeting; tube funnel-shaped, short and broad; stamens median; flesh white, subacid. July, early August.

Early Prolific (No. 332)—Origin, Russia—Fruit medium, roundish truncated to roundish oblate, somewhat angular; surface yellow, mostly covered with dull red, mixed, with dark crimson stripes and splashes, a whitish net-veining dulls the coloring; dots large, white, scattered; cavity small, regular, russeted; stem short to medium; basin wavy, rather deep, abrupt; calyx half open. Core regular, closed; tube funnel-shaped; stamens marginal, flesh whitish, somewhat astringent, acid. Quality good for cooking only. Early August.

Elgin Beauty—Fruit small, roundish, somewhat conical, irregular; surface yellow, thinly striped and splashed dull red, mixed on sunny side; dots whitish, minute, nearly invisible, a few distinct russet dots; cavity narrow, acute, russeted; stem short; basin wide, nearly flat, corrugated, with marked protuberances; calyx closed. Core open; seeds six to nine, and one imperfect, plump; flesh white, moderately juicy, sweet, good. Early fall. Originated at Elgin, Minn., by O. D. Rollins.



Estalline.

Estalline—Originated by O. F. Brand, Faribault, Minnesota; tree early and abundant bearer—Fruit medium or below, irregular, somewhat angular,

roundish, flattened at ends; surface often with irregular swellings, greenish yellow, handsomely striped with bright red, red extending over most of the apple; dots obscure, few, minute, white; cavity narrow, regular, acute; stem medium; basin very abrupt, wavy, moderately deep; calyx closed, segments very large, leafy, erect, convergent. Flesh juicy, crabby texture, acid, good. Season immediately after Duchess. Raised from Duchess seed about 1878.

Eureka—Originated in Wisconsin, from seed of Tolman Sweet. This is distinct from the Eureka described by Downing which is a fall apple of supposed Connecticut origin—Fruit large, roundish oblate, regular; surface roughened by russet dots and leather-cracking, light yellow, handsomely striped with bright crimson, especially on sunny side; cavity acuminate, regular, slightly russeted; stem short; basin abrupt, deep, nearly smooth. Core closed; seeds few, flattened; flesh white, fine grained, moderately juicy, sweet, very good. A long winter keeper.

Evaline—Origin, northern Iowa—Fruit medium, regular, roundish, slightly conic, sometimes unequal; surface smooth, greenish yellow, becoming a rich yellow on sunny side; dots numerous, minute, obscure, white; cavity regular, russeted; stem medium, erect; basin shallow, narrow, finely wrinkled; calyx half open. Core large, closed, regular, clasping, outline well defined; seed large, light brown, flesh whitish, juicy, crisp, subacid, good, use mostly culinary. All winter.

Ferris Wheel—Originated by J. C. Ferris, Hampton, northern Iowa; shown at Iowa State Fair, September, 1900—Fruit medium, oblate conic, nearly regular; surface covered with a brilliant solid very dark crimson, showing little of the yellow ground; dots distinct, numerous, minute, white; cavity obtuse, regular, wide, with stellate russet or green patch; stem short; basin shallow, narrow, smooth; calyx closed, segments flat convergent. Core closed, axile, sessile; cells round, slit; tube funnel-shaped; stamens marginal; seeds large, flat; flesh white, rather dry, sweet, good. Fall.

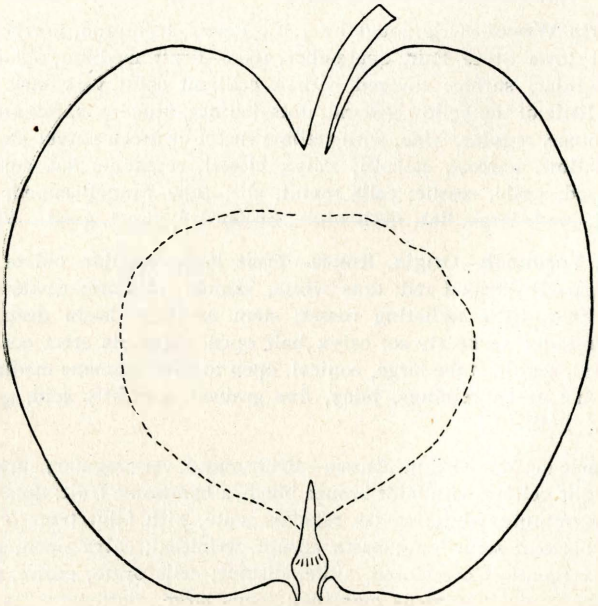
Flat Voronesh—Origin, Russia—Fruit large, regular, oblate; surface green, sparsely striped red; dots white, minute, obscure; cavity regular, acute, with a little radiating russet; stem medium; basin deep, abrupt, smooth, regular, or nearly so; calyx half open, segments erect convergent. Core closed, sessile; tube large, conical, open to core; stamens median; flesh white, some green veinings, juicy, fine grained, sprightly acid, good, use culinary. Fall.

Fonaric (95 M)—Origin, Russia—Fruit round, very regular; surface clear bright, light yellow, with faint bronze blush, a handsome fruit; dots obscure, numerous, minute, white; cavity regular, acute, with faint trace of stellate russet in bottom; stem long; basin abrupt, wrinkled; calyx open, segments erect convergent. Core closed, axile, distant; cells ovate, entire, roundish ovate; tube conical; stamens marginal; seeds large, flattened; flesh white, fine grained, subacid, good. Fall.

Fosburg—Fruit large, regular, roundish oblong; surface much like Oldenburg in coloring; dots obscure, numerous, whitish; cavity regular, acuminate, trace of russet; stem medium; basin abrupt, narrow, ribbed; calyx closed, segments erect convergent. Core closed, axile; cells ovate, slit; tube conical; stamens median; seeds nine, long, pointed; flesh white, moderately juicy, trace of astringency, acid, fair. Culinary. August, September.

Garden (No. 214)—Origin, Russia; this is identical with Kustoe No. 215 as fruited in the Iowa Experiment Station orchard—Fruit small, regular, oblate, truncate; surface yellow, covered with stripes and broad splashes of dark red on sunny side; dots white, minute, numerous; cavity wide, very shallow, often flat; stem very peculiar, very short, thick and fleshy, like a shoe peg stuck into the apple; basin wide, shallow, regular; calyx closed. Core closed; flesh white, juicy, fine grained, sweet, good. August, September. A pleasant flavored little eating apple for home use.

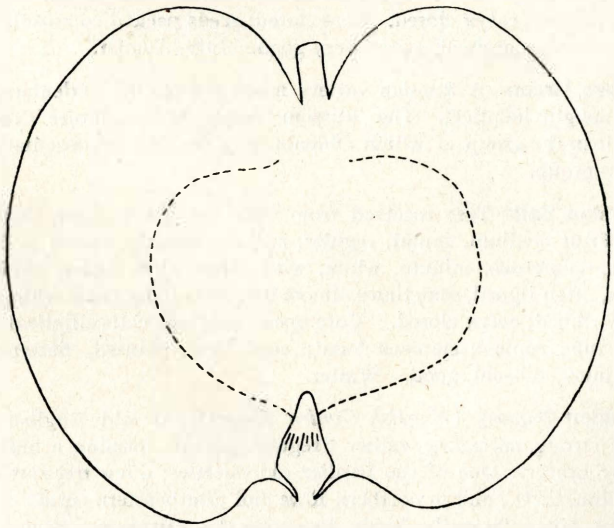
Getman—Origin, Russia—Fruit large, roundish, somewhat oblong; surface yellowish green, sometimes faintly striped dull red; dots distinct, numerous, large, gray, many with russet centers; cavity narrow, acute, regular; stem medium; basin narrow, shallow; calyx closed, segments connivent. Core closed; cells elliptical, axile, entire; tube conical; stamens marginal; seeds many, large, light brown; flesh white, juicy, sharp acid, culinary. Late fall. Of the Anis type. See Anis group.



Gideon.

Giant Swaar—Specimens from J. S. Harris, LaCrescent, Minnesota—Fruit large, very regular, roundish, somewhat conical; surface clear waxen yellow, somewhat polished; dots many, minute, green, a few large russet specks; cavity regular, deep; a very large russet patch extending out over base; stem short; basin very shallow, narrow, nearly smooth, minute wrinkles; calyx closed, segments connivent, small. Core wide open; cells abaxile, ovate, slit; tube conical; stamens basal; seeds very plump; flesh snow white, very juicy, sprightly refreshing subacid, good. September.

Gideon—Originated by the late Peter M. Gideon, Excelsior, Minnesota—Fruit large, roundish oblong conical, regular, slightly ribbed; surface a clear yellowish white, with faint bronze blush, an attractive color; dots white, suffused, numerous, minute, distinct; cavity wide, medium deep; stem medium to long; basin wide, shallow, somewhat corrugated; calyx closed. Core large, half open, clasping; cells obovate, slit; tube funnel-shaped; stamens marginal; seeds few, large, flattened, long, pointed; flesh white, juicy, brisk subacid, good. Late fall.



Gipsy Girl.

Gipsy Girl - Origin, Russia; one of the hardiest, most vigorous and productive of the Russian apples at Ottawa, Canada, where the fruit keeps till February. A fall apple at Des Moines, Iowa—Fruit above medium to large, irregular, oblate, angular; surface very highly colored, a clear light waxen yellow, almost wholly covered with bright, solid dark crimson on sunny side, on shady side the crimson is thinly marbled and mottled like a water colored painting; dots distinct, few, minute, white; cavity regular, acute, with stellate russet; stem short; basin wide, rather shallow, angular, occa-

sionally abrupt; calyx closed, segments connivent. Core open; cells elliptical, slit, roomy; tube conical; stamens marginal; seeds large; flesh snow white, slightly stained next to the skin, very tender, breaking, juicy, sprightly acid, good. August.

Gladstone—A new variety from England—Fruit large, regular, roundish, somewhat tapering; surface yellow, mostly covered with dark crimson stripes, much like Oldenburg; dots obscure, few, minute, whitish; cavity regular, acute, with small radiating russet patch; stem short to medium; basin nearly smooth, regular, rather shallow; calyx closed, segments connivent. Core closed, central; cells ovate, axile, slit; tube funnel-shaped; stamens basal; seeds large, plump; flesh yellow, fine grained, juicy, acid; cooking only, rather poor. August, September. J. P. Jackson, Glenwood, Iowa, says: "Quality as good as Haas, but inferior to Duchess."

Glass (No. 85 M)—Origin, Russia—Fruit medium, oblong, regular, truncated; surface yellow, with broken stripes and splashes of red; dots few, obscure, whitish; cavity regular, russeted, acute; stem short; basin deep, abrupt, regular; calyx closed. Core closed; seeds packed compactly in cells; flesh white, fine grained, sweet, very good. July, August.

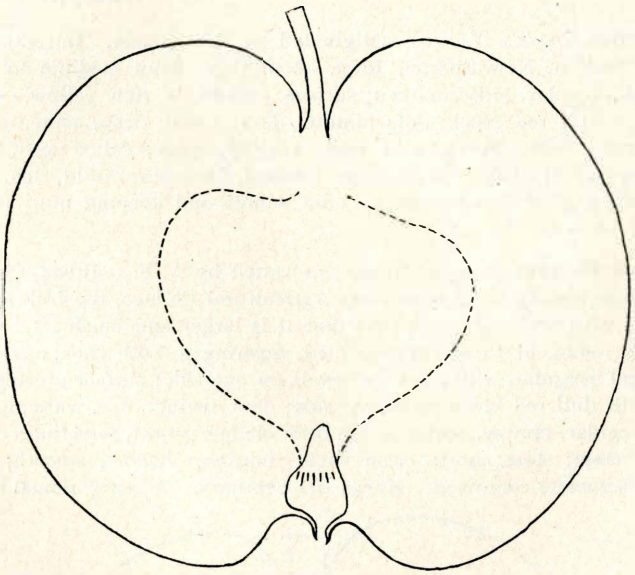
Glass Green—A Russian variety much resembling Oldenburg and by some thought identical. The Russian Apple Nomenclature Commission placed it in the group of which Oldenburg is the best representative. See Duchess group.

Golden Ball—Tree received from Ohio by R. P. Speer, Cedar Falls, Iowa--Fruit medium, round, regular; surface smooth, golden yellow; dots obscure, numerous, minute, white, with large white bases; cavity wide, shallow, often lipped, sometimes almost flat; stem long; basin wide, shallow, slightly ribbed; calyx closed. Core open, meeting; cells elliptical, abaxile, entire; tube conical; stamens basal; seeds long, pointed, flattened; flesh white, juicy, subacid, good. Winter.

Golden Russet (*English Golden Russet*)—An old English variety. Tree of strong, spreading, rather irregular growth, forming a bushy head, an early bearer. One of the hardier old varieties; a few trees are found at Vermillion, S. D., and in northern Iowa and Southeastern corner of Minnesota, but not sufficiently hardy for general cultivation.—Fruit medium, very regular, roundish, slightly conical; surface pale greenish yellow, mostly covered with russet; dots distinct, few, gray; cavity regular, obtuse; stem short; basin smooth, medium, leather-cracked; calyx open, segments erect convergent. Core open; cells ovate, entire; tube conical; stamens median; seeds plump, short; flesh firm, rich, spicy, pleasant, mild subacid, very good. January to May.

Golden White (Nos. 978, 979, 981)—Origin, Russia. This name is not descriptive, but was retained for the present by the Russian Nomenclature Commission—Fruit large, roundish, somewhat tapering, sometimes angular;

surface yellow, with dark crimson splashes, mixed and marbled; dots large, grayish white, distinct; cavity shallow, wide, with radiating patch of russet; stem medium; basin shallow, narrow, corrugated; calyx half open. Calyx tube funnel-shaped; stamens median; flesh yellowish white, pleasant subacid, good. Late fall, between Oldenburg and Longfield.



Golden White.
(Nos. 978, 979, 981)

"GOLDEN WHITE GROUP.

Large Long White, 979, of Tuttle and Mitchell; Golden White, 978, of Tuttle and Mitchell; White Russet, 981, of Tuttle and Mitchell; Nos. 4 and 5, Orel, of Budd; No. 56, Vor., (spurious); Winter Stripe; Avenarius No. 15, Department, of Patten. The name does not describe the apple, but it is adopted until the true name can be ascertained.

DESCRIPTION: *Golden White* (Nos. 978, 979, 981)—Size 5 to 6; form, roundish, slightly angular; color, light yellow, striped and splashed with red; dots, white; cavity, wide, regular; stem, short to medium; basin, shallow, slightly corrugated; calyx, half open; flesh, yellowish white; flavor, subacid; season, fall; origin, Russia; tree, irregular grower.

J. B. Mitchell: Nos. 978, 979 and 981 are all alike; the buds are very prominent, thick and woolly. I quit propagating the trees, but people

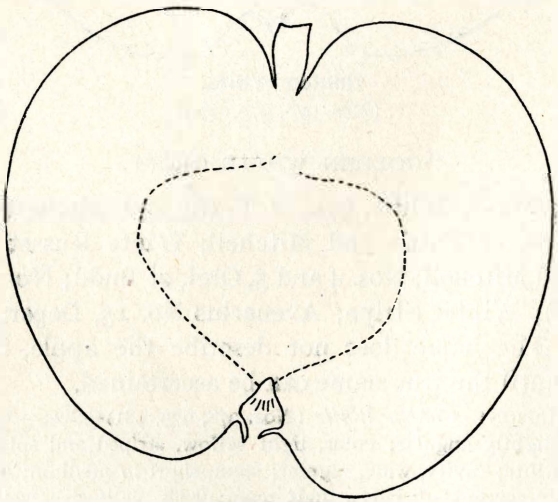
who had bought trees kept coming to me for more, so I began again two years ago.

J. Sexton: No. 4 Orel and 5 Orel are like Mallett 980 in leaf and like the above three in fruit.

A. G. Tuttle: In my neighborhood Golden White is a very good apple." (*Rus. Nom. Com.*)

Goode (*Goode's No. 10*)—Originated by Mrs. Goode. Introduced by Abner Branson, New Sharon, Iowa, about 1895—Fruit medium to large, roundish, regular, axis inclined; surface smooth, a rich yellow, with a bronze or dull red blush; dots minute, dark; cavity deep, acute, regular, russet; stem short, stout; basin wide, shallow, wavy; calyx open. Core medium, closed; flesh yellowish, fine grained, firm, flavor mild, rich, pleasant subacid, good to very good. Late winter, and keeping until July or August.

Good Peasant—Origin, Russia; as fruited by A. F. Collman, Corning, Iowa, from trees received from Iowa Agricultural College, the fruit appears identical with his Longfield except that it is larger and much later—Fruit medium, roundish, somewhat truncated, tapering to both ends, mostly unequal and irregular, with a decided swell on one side; surface greenish yellow, with dull red blush on sunny side; dots distinct, few, white, minute; cavity regular, narrow, acute, with a little stellate russet, sometimes considerable russet; stem short; basin small, narrow, shallow, smooth; calyx closed, segments connivent. Keeps till February. A heavy annual bearer.



Grandmother.
(No. 469)

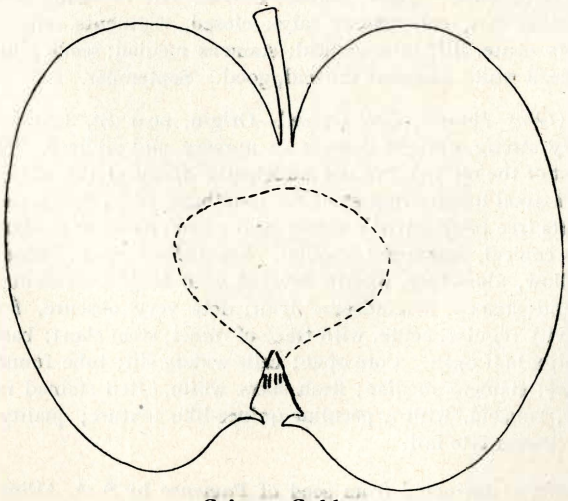
Grandmother (No. 469)—Origin, Russia; the Russian name Babuscheno means grandmother—Fruit medium or above, regular, roundish oblate, some-

what conical; surface green, with dull red cheek obscurely striped; dots large, numerous, white, some areolar, with whitish bases; cavity very wide and shallow, regular, russet, the russet often extending out in a large irregular patch; stem very short and stout; basin rather narrow and shallow, regular; calyx closed, segments broad, large, erect convergent. Core closed; flesh firm, whitish, juicy, subacid, good. Early winter.

Grand Sultan--See Vineuse Rouge.

Green Butskaya (No. 382)—Origin, Russia. Tree very productive, but fruit too acid—Fruit medium or below, round, oblate, slightly angular and ribbed; surface greenish yellow, mostly covered with dark crimson stripes and splashes, entire fruit covered with a thick blue bloom; cavity acute, regular; stem short; basin ribbed and wavy, rather wide and abrupt; calyx closed. Core open or closed; tube wide, funnel-shaped; stamens marginal; flesh white, juicy, acid, poor. Early August.

Green Sweet (*Green Sweeting* No. 169)—Origin, Russia. Specimens from F. J. Peterson, of Waconia, who writes: "A good hardy tree, and rather low open top, and a very shy bearer."—Fruit medium, very regular, roundish conical; surface greenish yellow, mostly thinly covered with dull red stripes and splashes; dots obscure, few, white; cavity regular, obtuse, trace of stellate russet; stem long; basin very shallow (nearly flat), slightly wrinkled; calyx half open or open, segments flat convergent. Core open, sessile; cells nearly entire, abaxile, large, roomy; tube funnel-shaped; stamens median; seeds numerous, small, sharp, pointed; flesh mild subacid, sweet. Fall.



Grimes Golden.

Grimes Golden—Origin, Brooke County, Virginia, on the farm of Thomas Grimes. Tree vigorous, upright, spreading, a good early annual

bearer. In the west this variety and Jonathan are the standard of high quality, nothing better is known. Not sufficiently hardy at the north. Fine specimens raised near Yankton have been shown at the South Dakota State Fair. In Station orchard at Brookings we have succeeded in raising a few by top-grafting on Hibernal—Fruit above medium, regular, cylindrical, sometimes roundish oblate; surface rich golden yellow, sometimes with thin open net-veining of russet; dots obscure, many, white, minute, with a few russet dots; cavity regular, obtuse, slightly russeted; stem medium; basin deep, abrupt, uneven, somewhat wrinkled; calyx closed or half open, segments divergent. Core small, slightly open, pyriform, meeting; cells obovate; tube conical; stamens basal; seeds many, short, plump; flesh yellow, firm, compact, crisp, aromatic, rich, spicy subacid; quality best. December to March.

Grundy (*Thompson Seedling* No. 38)—Originated in Grundy County, northern Iowa, by J. S. B. Thompson; tree vigorous and spreading; an abundant and prolific bearer—Fruit large, regular, roundish, flattened at the ends; surface yellow, mostly covered with dark marbled and mixed red, with grayish net-veinings; dots white, minute, inconspicuous; cavity regular, narrow, acuminate, with large, radiating patch of russet; stem short, completely filling lower part of cavity; basin deep, abrupt, slightly wavy; calyx wide open. Core closed; seeds short, plump; flesh white, tender, juicy, subacid, very good. September and October.

Gruskirka—Origin, Sweden; specimens from F. J. Peterson, Waconia, Minnesota—Fruit below medium, regular, roundish oblong conical; surface waxen, polished, pale yellow, turning to white; dots white, obscure, minute, suffused; cavity wide, regular, obtuse, considerable radiating russet; stem medium; basin flat, corrugated; calyx closed, segments reflexed. Core closed; cells ovate, slit; tube conical; stamens median; seeds plump, large, rounded; flesh white, pleasant subacid, good. September.

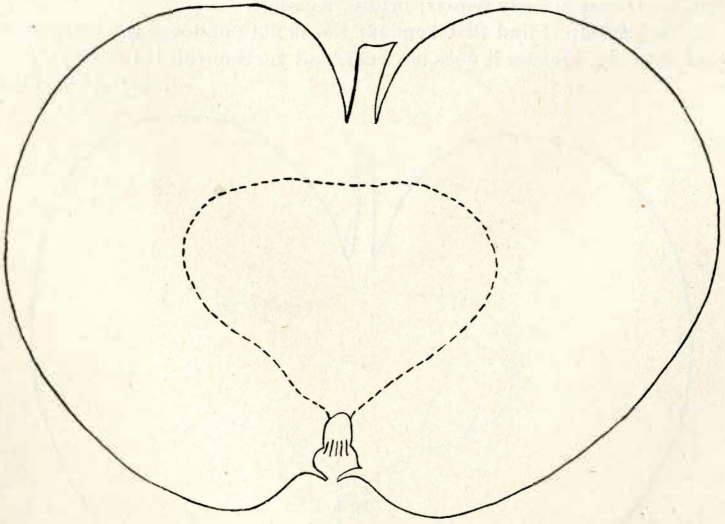
Haas (*Gros Pomier, Fall Queen*)—Origin, near St. Louis, Missouri, tree of very strong, upright growth in nursery and orchard. Tree one of the hardiest of the old list, but not sufficiently hardy at the north. Where hardy it is a good top-grafting stock for Jonathan. R. P. Speer, Cedar Falls, Iowa, reports tree productive on sandy land—Fruit medium or above, roundish oblate, conical, obscurely angular; skin thick, tough, becoming oily; surface yellow, almost or wholly covered with bright crimson, marbled, splashed and striped, a handsome fruit; dots very obscure, few, white, minute; cavity regular, acute, with trace of russet; stem short; basin abrupt, narrow; calyx half open. Core open; cells widely slit; tube funnel-shaped, open to core; stamens median; flesh snow white, often stained red next to skin, juicy, subacid, with a peculiar quince-like texture; quality fair; use culinary. Season late fall.

Hamburg—Originated from seed of Fameuse by S. A. Alling, Homer, Minnesota. Its characteristics indicate that it is a cross of Fameuse with Plumb Cider—Fruit with shape of Plumb Cider and color of Fameuse; form

roundish oblong conical; surface smooth, polished, yellow, almost or wholly covered with brilliant dark crimson, with obscure splashes and stripes, coloring almost solid on sunny side; dots very obscure, few, whitish, minute; cavity regular, smooth, acuminate, narrow; stem long, slender; basin very shallow, or flat, narrow, faintly wrinkled; calyx closed, segments erect convergent. Core slightly open, clasping, large; tube funnel-shaped; stamens extremely marginal, touching segments (same as in Plumb Cider); seeds many, angular, short, pointed; flesh white, tender, delicate, juicy, pleasant subacid, much like Fameuse, very good. Early winter.

Hardin (*Thompson Seedling* No. 46)—Originated by J. S. B. Thompson, Grundy County, Iowa. Tree an abundant bearer—Fruit large, oblate; surface green, tinged with red; cavity wide, obtuse; stem medium; basin narrow, abrupt. Core small, clasping; tube broad, long, funnel-shaped; stamens median; flesh subacid, good. November.

Hare Repka—Origin, Russia—Fruit medium, conic, obscurely angular, surface yellow; dots distinct, numerous, white; cavity narrow, regular, acuminate, considerable radiating russet; stem long; basin narrow, ribbed; calyx closed, segments erect convergent. Core barely clasping; cells obovate, entire; tube funnel-shaped; stamens median; flesh white, acid, good. Early summer. F. J. Peterson, Waconia, Minnesota, writes: "A very hardy tree, with low, spreading top."



Hibernal.

Hibernal—Origin, Russia; this variety represents what is probably the hardiest type of the Russian race of apples; there are several sorts closely resembling, or identical with, Hibernal. Tree vigorous, very spreading, productive. The strong spreading growth makes it especially desirable as a

stock for top-grafting, probably the best we have at the present time—Fruit large, irregular, oblate to roundish oblate, conical; skin thick; surface greenish yellow, with a dull bronze mixed red on sunny side, with a few dull crimson splashes; dots white, minute, obscure, often some large russet dots; cavity regular, medium deep, with a large patch of russet radiating out irregularly over nearly the entire base, this is a marked characteristic; stem medium, often short; basin narrow, rather shallow, wrinkled; calyx half open or open. Core closed, meeting; tube funnel-shaped; stamens median; seeds few; flesh acid, with some astringency, juicy, good for cooking. Early winter.

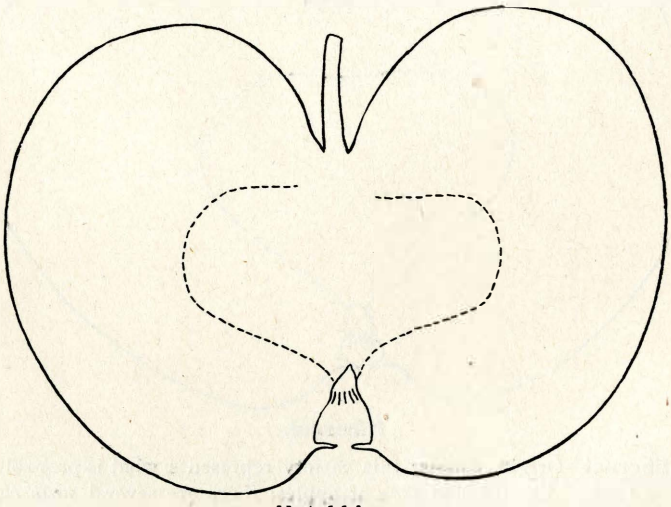
"HIBERNAL GROUP.

Hibernal, No. 378; Lieby or Recumbent, 240; Yellow Arcadian, 327; Juicy Burr, 544 (spurious); Romenskoe, 599 (spurious); Silken Leaf, 75 M.; Recumbent, 41 M.; Zusoff, (spurious); Pendent Ear; Omensk, (spurious); Romna, (spurious); Ostrakoff, United States Department, (spurious).

DESCRIPTION: *Hibernal*—siez, 5; form, oblate; color, yellowish green, stripes and splashes of pale red, many white dots; cavity, medium narrow, deep, russeted extending over base; stem, medium; basin, broad, medium deep, corrugated; calyx, half open; flesh, yellowish green, medium fine; flavor, sour; season early winter; origin, Russia.

C. G. Patten: I find that Pendent Ear is not one-tenth the value of Hibernal with me, because it does not bear, and yet the fruit is the same."

(*Rus. Nom. Com.*)



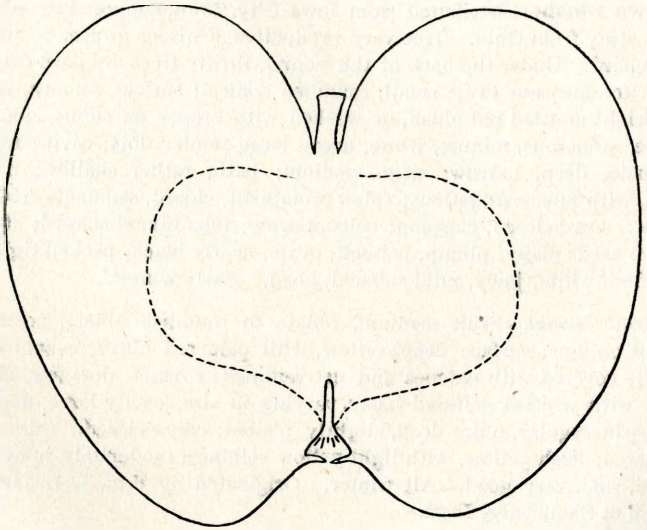
Hotchkiss.

Hotchkiss—A seedling originated by Mrs. Kimball, Winnebago City, Minnesota. The large size and long keeping capacity makes it worthy of

attention if tree proves hardy, although the fruit lacks in attractive color—Fruit large, oblate, nearly regular; surface dull green, with faint bronze blush, roughened by russet dots; dots distinct, numerous, russet, small; cavity regular, deep, obtuse, with stellate russet; stem short; basin rather shallow, with minute wrinkles; calyx open, segments flat convergent. Core open; cells ovate, abaxile, entire; tube conical; stamens basal; seeds plump; flesh firm, juicy, pleasant subacid, good. All winter.

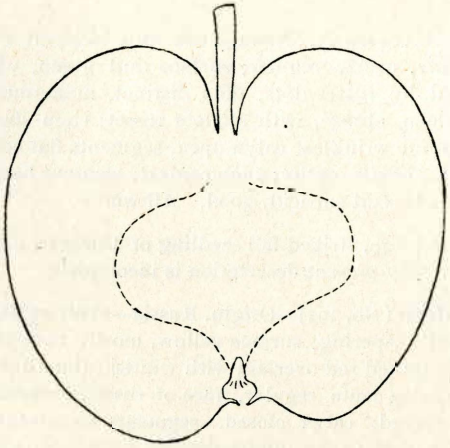
Hutchins—A large, striped fall seedling of Duchess, originated at Lake City, Minnesota. My present description is incomplete.

Imperial Citron (No. 393)—Origin, Russia—Fruit small, regular, roundish oblate, slightly tapering; surface yellow, mostly covered with dull red splashes and thin mixed red overlaid with whitish; dots distinct, numerous, white, minute; cavity acute, regular, trace of russet; stem short; basin shallow, somewhat ribbed; calyx closed, segments connivent. Core closed; cells round, entire, axile; tube funnel-shaped; stamens marginal; seeds ten, short, plump; flesh white, juicy, subacid, fair. August.



Iowa Beauty.

Iowa Beauty—Originated by C. G. Patten, Charles City, Iowa—Fruit large, roundish truncated, irregular, angular; surface golden yellow, striped, splashed and mixed dark red, a handsome fruit; dots white, minute, obscure; cavity deep, acute, often green; stem short to medium; basin very wide, obscurely five-sided, wavy, corrugated and wrinkled; calyx closed. Core clasping, half open; tube conical; stamens median; flesh rich yellow, firm, juicy, acid, good. Fall. A seedling of Golden Russet. Follows the Duchess in season.

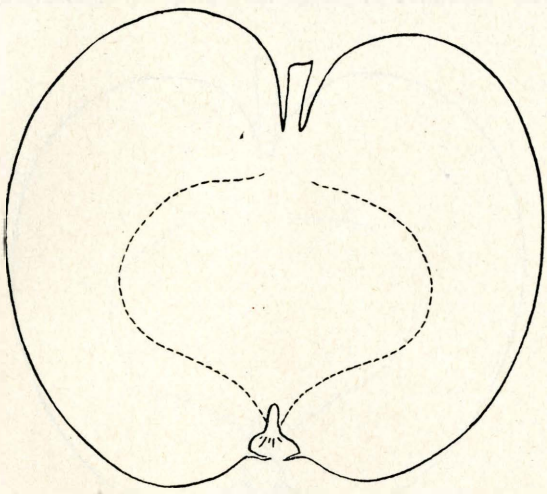


Iowa Blush.

Iowa Blush--Distributed from Iowa City, Iowa, supposed to be an unknown stray from Ohio. Tree very productive, a strong grower in nursery and orchard. Under the bark of the young, thrifty trees are hard detached warty excrescenses—Fruit small, roundish conical; surface smooth, yellow, with bright mottled red blush, or washed with bronze on sunny side; dots obscure, numerous, minute, white, many large areolar dots; cavity regular, acuminate, deep, narrow; stem medium; basin rather shallow, narrow, abrupt, with fine corrugations; calyx prominent, closed, segments erect convergent. Core closed, clasping; cells obovate; tube funnel-shaped; stamens median; seeds many, plump, pointed, ovate, nearly black, packed tightly in cells; flesh white, juicy, mild subacid, good. Early winter.

Iowa Russet—Fruit medium, oblate to roundish oblate, sometimes slightly oblique; surface deep yellow, with pale red blush on sunny side, partially covered with patches and net-veinings of russet; dots few, grayish brown, with whitish suffused bases, varying in size; cavity large, deep, obtuse; basin regular, quite deep, slightly plaited; calyx closed. Core small; seeds large; flesh yellow, with light yellow veinings, moderately juicy, mild subacid, rich, very good. All winter. Originated by Prof. J. L. Budd, on his farm at Shellsburg, Iowa.

Isham Sweet—Origin, Wisconsin—Fruit medium, roundish, slightly tapering; surface yellowish green, mostly covered with brownish red, solid and mixed on sunny side, striped and broadly splashed on shady side; dots distinct, russet, numerous, minute, a few large russet dots; cavity regular, acute, with much radiating russet; stem short; basin very shallow, minutely wrinkled; calyx open, segments flat convergent. Core closed; cells round, entire; tube funnel-shaped; stamens median; seeds long, large, flat; flesh very yellow, with yellow veinings, firm, very sweet; quality very good. Late fall, early winter.



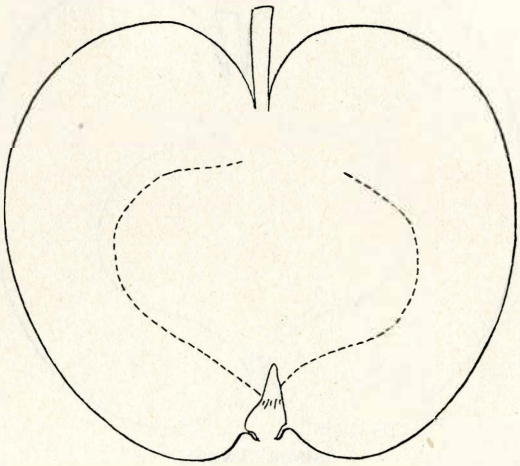
Isham Sweet.

Jersey Beauty—Specimens from Iowa Experiment Station orchard, 1902—Fruit large, roundish oblate, tapering; surface greenish yellow, mostly covered with red stripes and splashes mixed on sunny side; dots obscure, few, gray, minute; cavity wide, regular, green; stem very short; basin very wide, very shallow, obscurely ribbed; calyx open, segments long, divergent. Core large, meeting; cells ovate, slit; tube funnel-shaped; stamens marginal; seeds ten, large, long, pointed, somewhat flattened; flesh very yellow, pleasant subacid, good. August, September.

Johnson—The Minnesota variety by this name is described under the name of William Johnson to distinguish it from other and older varieties of the same name.

Jonathan—Origin, Kingston, New York; this and Grimes Golden are considered the two best varieties for dessert use in the west. Jonathan is evidently of the Spitzenburg type and by some considered to be a seedling of that variety. Tree not hardy, in northern Iowa, Minnesota or the Dakotas, but specimens have been raised in a small way in very favorable locations and between the test winters, by top-grafting on hardy stocks—Fruit medium, roundish oblong, somewhat conical, truncated, regular; surface very smooth, clear light yellow, almost or wholly covered with solid brilliant dark red on sunny side, on shaded side mixed and striped with lighter red; dots distinct, many, minute, whitish; cavity acute, deep, regular, with stellate russet; stem long, slender; basin deep, smooth, very abrupt, rather wide; calyx small, closed, segments connivent. Core closed, scarcely clasping; cells obovate; tube conical; stamens median or basal; seeds plump, long, pointed; flesh white, very tender, juicy, spicy, aromatic, sprightly

subacid, best. December to March north, late fall and early winter in the south.

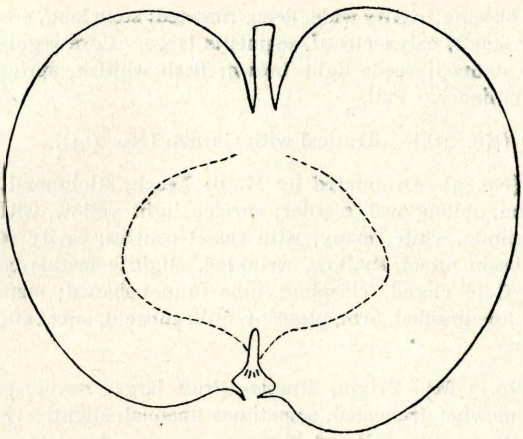


Judson.
(*Thompson's Seedling* No. 29)

Judson (*Thompson's Seedling* No. 29)—Originated in Grundy county, northern Iowa, by J. S. B. Thompson—Fruit large, roundish oblong conical, regular; surface greenish yellow, mostly covered with dark red, with crimson stripes and splashes on sunny side; dots distinct, white, few, small; cavity regular, medium deep, slightly acuminate, with much stellate russet; stem long; basin shallow, narrow, abrupt, ribbed and minutely wrinkled; calyx half open, segments erect convergent. Core half open; cells ovate, slit; tube conical; stamens median; seeds few, short, plump; some imperfect, flesh white, subacid, good. Winter.

Juicy White (No. 157)—Origin, Russia—As exhibited by J. S. Harris is much like Yellow Transparent, but stem perhaps longer and basin more corrugated. The name is the American translation of the Russian Bielui Naliv and White Naliv is the name adopted by the American Pomological Society.

Kaump (*Harry Kaump*)—Origin, Wisconsin. Tree very productive and doing well in northern Iowa; now on trial list of Minnesota State Horticultural Society—Fruit small, roundish, regular; surface yellowish green, sometimes with dull brown cheek; dots white, distinct; a few with russet centres; cavity acute, regular, with radiating patch of russet; stem medium; basin narrow, small, smooth, abrupt; calyx half open. Core open; tube funnel-shaped; stamens median or basal; seeds few, large, plump; flesh white, fine grained, subacid, good. Winter.



Kaump.
(*Harry Kaump*)

Kavelos—From F. J. Peterson, Waconia, Minnesota—Fruit very large, not heavy for its size, oblate conic, nearly regular; surface yellowish green, thinly striped and splashed dull red; dots obscure, few, whitish, large; cavity acuminate, wide, regular, slight radiate russet; stem short to medium; basin deep, very abrupt, irregular; calyx half open, segments erect convergent. Core open; cells obovate; tube long, funnel-shaped, open to core; stamens median; seeds ten, small, plump, pointed; flesh coarse grained; acid, fair; use culinary. Summer. Tree upright, closed top; a light annual bearer. Received from Horticultural Department, Sweden.

Kievskoe—Origin, Russia. Fruit much like true Romna, but "tree has a roundish, somewhat flattened top while Romna is quite upright in habit." —Fruit large, very regular, conical; surface green, with dull bronze blush on sunny side, roughened by dots; dots distinct, numerous, minute, russet; cavity regular, acuminate, narrow, with radiating russet; stem medium; basin abrupt, narrow, regular, medium; calyx open, segments divergent. Core closed, sessile; cells axile, ovate, slit, large, rounded; tube conical; stamens median; seeds thirteen, short, plump; flesh white, juicy, pleasant, mild subacid, good. Winter.

Kluevskoe (No. 28 M)—Origin, Russia—Fruit medium, roundish oblate, faintly ribbed; surface polished, waxen yellow; dots obscure, minute, white, numerous, with whitish bases, suffused in the semi-transparent skin; cavity regular, acute, with large radiating patch of russet; stem short; basin ribbed, corrugations in bottom; calyx closed. Core half open; flesh white, fine grained, juicy, subacid, good. Use chiefly culinary. September.

Knowles Pippin—Specimens from old orchard of Iowa Experiment Station—Fruit medium, oblate conical; surface light yellow; dots minute,

white, very obscure; cavity wide, deep, russeted; stem long, erect; basin regular, rather small; calyx closed, segments large. Core regular, open, outline clearly defined; seeds light brown; flesh whitish, sprightly subacid, good. Use culinary. Fall.

Kustoe (No. 215)—Identical with Garden (No. 214).

Leach (No. 5)—Originated by H. B. Leach, Richmond, Minnesota—Fruit medium, oblong oval, regular; surface light yellow, with dull blush; dots very minute, white, many, with russet centres; cavity regular, acute; stem long; basin broad, shallow, wrinkled, slightly leather-cracked; calyx half open. Core closed, clasping; tube funnel-shaped; stamens median; flesh white, fine grained, firm, pleasant, mild subacid, sweet after taste, good Early winter.

Lead (No. 3 M)—Origin, Russia—Fruit large, heavy, solid, regular, roundish, somewhat truncated, sometimes unequal, slightly ribbed; surface greenish yellow, with dull red blush on sunny side; dots gray, distinct, many, on shaded side with green bases; cavity regular, shallow, acute; stem medium; basin wide, slightly corrugated; calyx open. Core half open; cells broadly elliptical, entire; tube conical; stamens marginal; seeds light brown, plump; flesh greenish white, with green veinings, sharp subacid, good. Early winter.

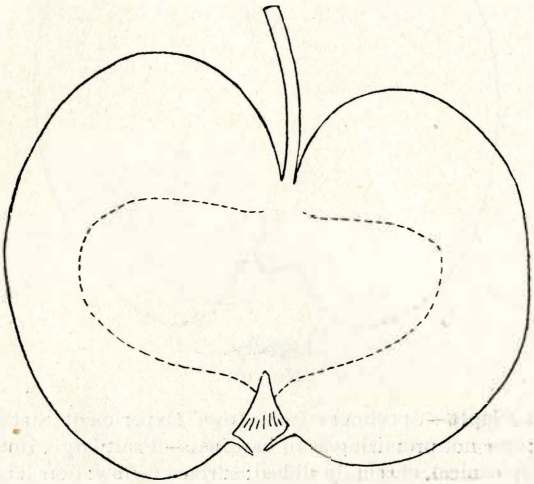
Lead (No. 362)—Origin, Russia. As received by J. B. Mitchell, Cresco, Iowa, this number is smaller and earlier than the true Lead (No. 3 M*)—Fruit medium, roundish, somewhat cylindrical; surface yellow; dots obscure, numerous, minute, suffused, white; cavity narrow, deep, acuminate, shallow, with stellate russet; stem short; basin flat, much corrugated; calyx closed, segments divergent. Core closed, distant, clasping; cells ovate, entire; tube funnel-shaped; stamens marginal; seeds about eleven, short, plump; flesh white, juicy, subacid, good. August, September.

Ledenets (No. 30 M)—Origin, Russia—Fruit medium to large, roundish oblate, regular, sometimes compressed; surface smooth, yellow, overlaid with heavy white net-veining of coalescent dots, sometimes with a dull reddish blush; dots very numerous, distinct, white, variable in size, mostly coalescent; cavity deep, regular, with a little russet; stem medium, stout; basin wide, shallow, corrugated; calyx closed, segments very long, pointed. Core open, clasping, axile; tube conical; stamens marginal; seeds large, rather numerous; flesh white, juicy, fine grained, brisk subacid, good. Use table and kitchen. Early winter.

Leipsic Borsdorf—Imported from Russia, name indicates German origin—Fruit very small, round, slightly tapering; surface yellow, with faint bronze blush; dots obscure, few, white, minute; cavity wide, regular,

*M following a number means the importation by Prof. J. L. Budd for the Iowa Agricultural College from the Agricultural College at Moscow, Russia, (Dr. R Schroeder), May, 1879.

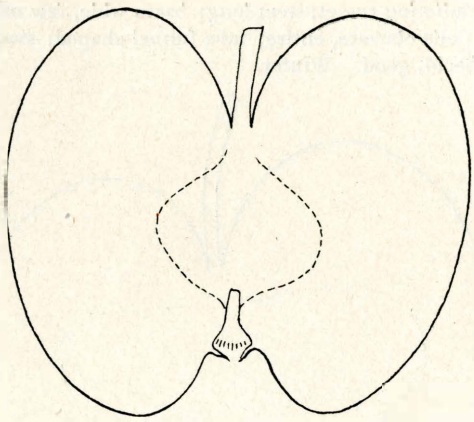
shallow, some radiating russet; stem long; basin wide, few minute wrinkles; calyx closed. Cells obovate, entire; tube funnel-shaped; stamens marginal; flesh white, subacid, good. Winter.



Ledenets.
(No. 30 M)

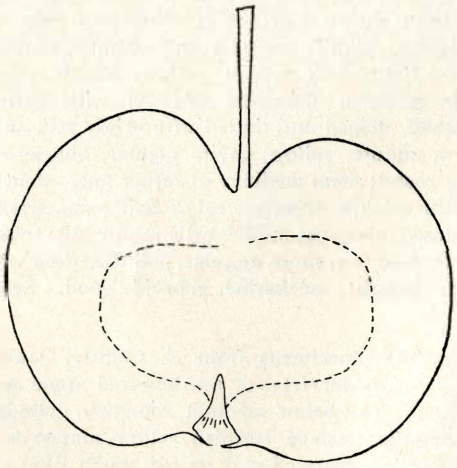
Leona—Originated by S. A. Alling, Homer, Minnesota. The fruit of two years has been shown together at Minnesota State Fair—Fruit below medium, regular, slightly unequal and oblique, oblate or depressed; surface unctuous, light clear golden yellow, mostly covered on sunny side with bright crimson, obscurely splashed with carmine on shaded side, thinly splashed, striped and dotted with bright red, an attractive fruit; dots obscure, few, minute, yellow; cavity regular, obtuse, some with light golden radiating russet; stem medium to rather long, stout; basin shallow, regular, wide, with minute wrinkles; calyx half open, segments erect convergent. Core closed, clasping, sessile; cells round, slit; tube funnel-shaped; stamens marginal; seed few, short, angular, pointed; flesh white, moderately juicy, firm, mild, pleasant, saccharine, subacid, good. Season late winter and spring.

Lightly (No. 16)—Specimens from E. Lightly, Oakland, Minnesota. This is one of about sixty survivors of one hundred apple seedlings sent out by Peter M. Gideon—Fruit below medium, roundish, cylindrical, truncated, regular, faintly angular; surface greenish yellow, almost or wholly covered with a fine dark crimson, marbled and mixed, much like a Jonathan, with blue bloom; dots minute, white, obscure; cavity acute, wavy; stem short; basin abrupt, narrow; calyx closed. Core small, closed; tube funnel-shaped; stamens marginal; seeds packed tightly in small cells; flesh firm, fine grained, slightly stained, subacid, good to very good. December or later.



Lightly.
(No. 16)

London Pippin—Specimens from Iowa Experiment Station orchard, Ames, Iowa; tree not promising as to hardiness—Fruit large, roundish, truncated, slightly conical, obscurely ribbed; surface yellow; dots large, suffused, white, few; cavity deep, wide, regular, russeted; stem medium; basin shallow, small, ribbed; calyx closed. Core small, barely clasping; flesh white, juicy, fine grained, subacid, good. Early winter.



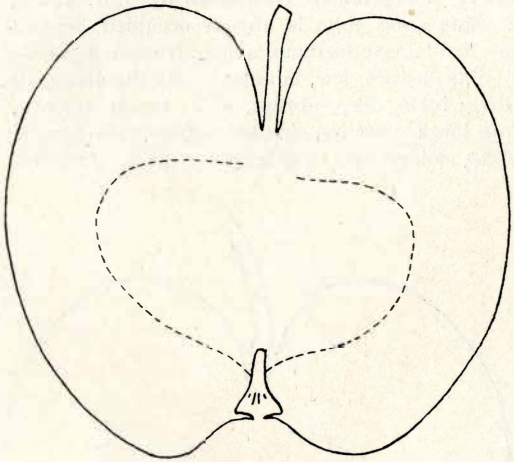
Long Arcade.

Long Arcade—A Russian variety doing well in Minnesota and northwest. The name is not descriptive as to shape but was retained by the Russian Nomenclature Commission. Tree very upright, spreading with age

—Fruit medium, oblate, slightly angular; surface greenish yellow, nearly covered with dark red, no distinct stripes nor splashes; dots minute, numerous, white, obscure; cavity regular, medium deep, broad, acute, with good sized radiating patch of russet; stem long, slender; basin wide, very shallow, wrinkled; calyx open. Core closed; tube conical; stamens marginal; seeds short, plump; flesh white, tender, juicy, mild subacid, with sweet after taste, very good. August to September.

"LONG ARCADE.

DESCRIPTION: *Long Arcade*—Size, 2 to 5; form, oblate, a little angular; color, greenish yellow, overspread with dark red, numerous inconspicuous fine white dots; cavity, medium broad, acute, russeted; stem, medium long, slender; basin, shallow, broad, wrinkled; calyx, medium open; flesh, white, coarse; flavor, mild, subacid; season, August to September; tree, very upright, spreading with age." (*Rus. Nom. Com.*)



Longfield.

Longfield—Origin, Russia; tree of moderate, spreading, pendulus growth; an early heavy annual bearer—Fruit medium, roundish conical, unequal, often obscurely angular; surface smooth, polished, clear waxen yellow, with a lively red blush; dots distinct, few, large, yellowish; cavity regular, deep, narrow, acuminate, with stellate russet; stem short; basin narrow, abrupt, wrinkled; calyx half open, segments large, divergent. Core closed, clasping; cells ovate, entire; tube funnel-shaped, long; stamens median; seeds few, large, long, plump, pointed; flesh very white, very tender and juicy, pleasant, brisk subacid, good. October, November.

"LONGFIELD GROUP.

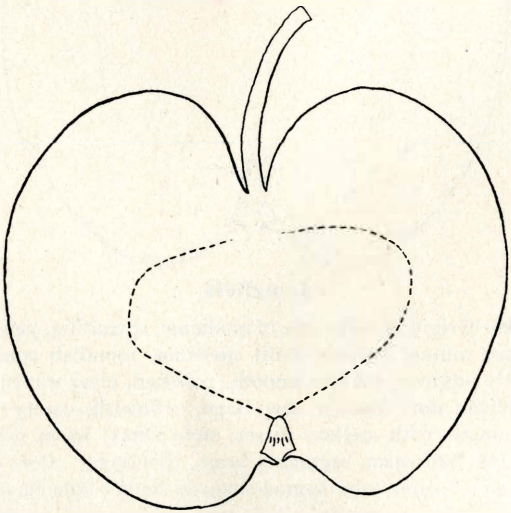
Longfield, 161; 57 M.; English Pippin, 587; Good Peasant (spurious); 387 (spurious).

DESCRIPTION: *Longfield*—Size, 4 to 5; form, roundish conical; color, shady side yellow with greenish bloom, sunny side yellow and red with small gray dots in skin; cavity, deep, smooth; stem, long; basin, flat, ribbed; calyx, half open; core, closed; flesh, white, fine grained; flavor, slightly subacid, aromatic; season, November to January; origin, Russia; tree, strong, spreading, drooping grower, grayish woolly leaves and shoots.

J. Sexton: No. 31 M is the true Good Peasant as received by Professor Budd direct from Moscow, but some Anisim scions were mixed with it, and the No. 387 spurious was simply mistaken for No. 587. We find 31 M hardier than Longfield and a good bearer.

A. G. Tuttle: I have 300 Longfield in orchard, and think it hardier than Duchess and that it will bear more abuse than any tree I know of, not excepting Hibernal. Longfield is a great annual bearer, a good table apple, and the leaf never scabs." (*Rus. Nom. Com.*)

Long Homer (*Long John*)—Originated by S. A. Alling, Homer, Minnesota. The name Long John is already occupied, hence the above suggested change—Fruit above medium, oblong truncated; surface nearly solid very dark red; dots obscure, few, minute; cavity regular, acute, slightly russeted; stem long; basin deep, abrupt, wide, nearly smooth, with minute wrinkles. Core large, clasping, circular outline; tube conical; stamens median; flesh white, stained next to skin, juicy, good. Late fall.

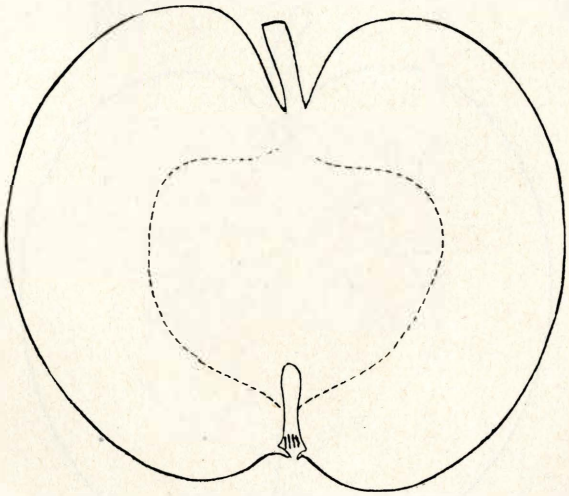


Lord.
(Lord's Longfield)

Lord (*Lord's Longfield*)—Originated from seed of Wealthy by O. M. Lord, Minnesota City, Minnesota, and named from its resemblance to Longfield—Fruit medium, roundish, somewhat conical, regular; surface greenish,

mostly or wholly covered with rosy crimson, a handsome fruit; dots minute, white; cavity deep, narrow, acute, with radiating patch of yellow; stem long; basin narrow, regular, abrupt, with fine wrinkles; calyx half open. Core closed, meeting; tube conical; stamens median; flesh white, stained next to skin, fine grained, firm, mild, pleasant, vinous subacid with sweet after taste, very good. Season a month or more later than Wealthy. The later fruits of this variety are so deeply colored with red that the Longfield part of the name can be dropped. Worthy of attention.

Louise (*Princess Louise*)—Originated near Grimsby, Ontario, Canada, on farm of L. Woolverton, probably from Fameuse seed—Fruit medium, roundish oblate, regular, obscurely angular, surface greenish yellow, almost or wholly covered with a fine solid dark red, with obscure splashes of darker red, sometimes with thin open network of russet; dots obscure, numerous, minute, whitish; cavity wide, obtuse, regular, green; stem medium, slender; basin smooth, rather shallow; calyx closed, segments connivent. Core half open; cells round, entire; tube funnel-shaped; stamens median; seeds few, short, plump; flesh tender, juicy, snow white, fine grained, pleasant, aromatic subacid, (Fameuse type), very good. October to December.



Lowland Raspberry.
(No. 340)

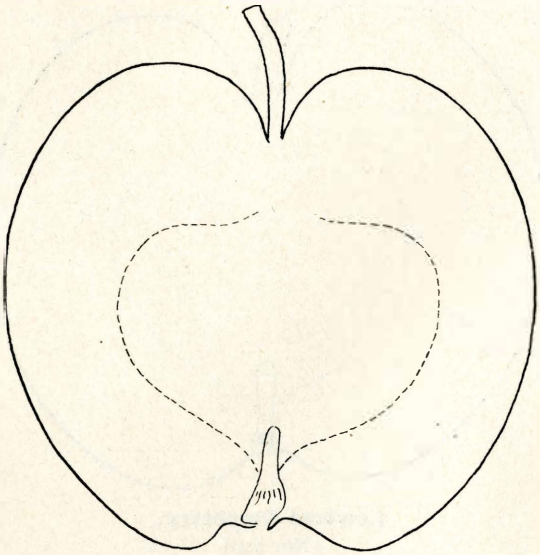
Lowland Raspberry (No. 340)—Origin, Russia. The name Lievland is the name of a Russian province (Livonia), bordering on the Baltic Sea, the above translated name is now preferred to Livland Raspberry, as suggested by Mr. Gibb—Fruit medium to large, roundish conical, regular; skin thin; surface smooth, polished, clear waxen white, striped, splashed, shaded and marbled with fine light crimson, a beautiful fruit; dots minute, greenish,

obscure; cavity deep, regular, acute; stem medium; basin small, regular; calyx small, closed. Core wide open; cells abaxile, large, roomy, entire, ovate; tube funnel-shaped; stamens marginal; seeds small, short, fifteen or more, and one or more imperfect, brown black; flesh snow white, stained with red next the skin, often much colored, with red veinings, very tender, fine grained, delicate, crisp, juicy, mild, very pleasant subacid, almost sweet, excellent. August.

"LOWLAND RASPBERRY.

DESCRIPTION: *Lowland Raspberry*—Size, 6; form, round conical; color, orange yellow, striped, splashed and shaded with red, showing gray dots through the color; cavity, medium broad, rather deep; stem, medium; basin, small, wrinkled; calyx, closed or half open; flesh, light yellow, often stained with red, fine, tender, juicy; core medium open; flavor, subacid, good; season, August (as early as Transparent); tree, medium upright, round topped, excellent; origin, Russia.

A. G. Tuttle: There is no early apple east or west of better quality than Lowland Raspberry. The tree is perfect and a good bearer, and the fruit is handsomely colored." (*Rus. Nom. Com.*)



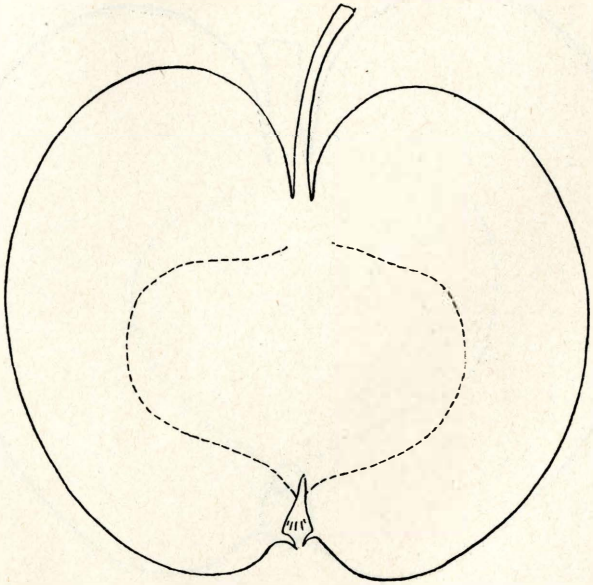
Lubsk Queen.
(*Lubsk Reinette*, No. 444)

Lubsk Queen (No. 444)—Origin, Russia. A fruit of remarkable beauty, always attracting much attention wherever exhibited—Fruit medium to large, regular, round, truncated; surface very smooth, polished and waxlike, a brilliant white, more or less covered with solid light rosy red, with deli-

cate white bloom, a self-colored apple, but sometimes with short red splashes on lighter ground; dots white, minute, numerous; cavity rather small, acute, slightly russeted; stem medium to long; basin wide, shallow, regular, with generally five fine corrugations around the eye; calyx closed, segments long, pointed. Core closed; cells ovate, slit; tube long, funnel-shaped; stamens marginal; seeds nine, plump; flesh snow white, firm, juicy, fine grained, subacid, good. August, September.

"LUBSK QUEEN.

DESCRIPTION: *Lubsk Queen*—Size, medium to large; form, rather round, flattened at the ends; color, polished waxy white, with bright blush on sun side, with numerous fine, irregular, gray dots showing through the skin, (a beautiful fruit); cavity, smooth, regular, greenish; stem, medium long; basin, broad, much wrinkled; calyx closed; flesh, nearly white; flavor, pleasant acid; season, August and September; tree, medium upright, good grower; origin, Russia. Not the Lubsk Queen of Tuttle, which is much like the White Pigeon." (*Rus. Nom. Com.*)

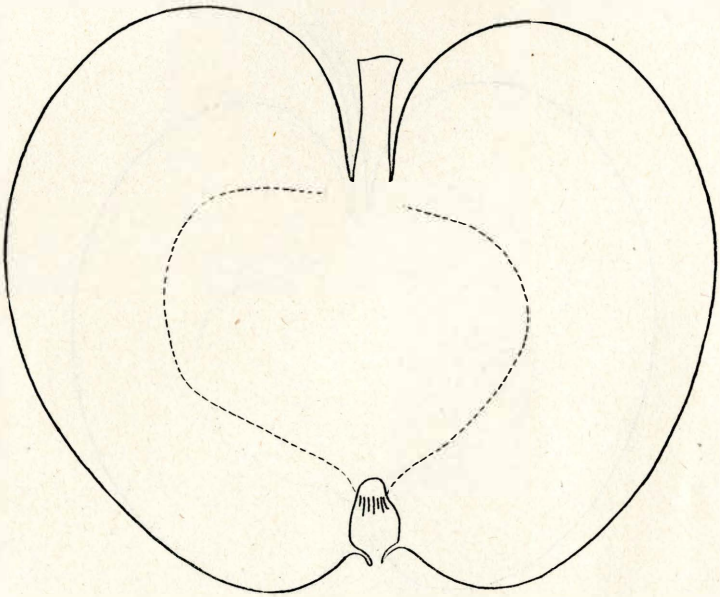


Lyman Sweet.

Lyman Sweet—Originated 1876, from Wealthy seed by the late H. M. Lyman, Excelsior, Minnesota. Awarded second premium as seedling, Minnesota State Fair, September 1, 1902—Fruit large, regular, roundish oblong; surface greenish yellow, almost wholly covered with fine solid dark red, a showy fruit; dots distinct, numerous, large, gray; cavity deep, somewhat acuminate, regular, narrow, trace of russet; stem long; basin regular, smooth,

very small and shallow; calyx closed, segments connivent. Core wide open, sessile; cells abaxile, elliptical, slit; tube conical; stamens marginal; seeds eight and one imperfect, large, plump; flesh white, sweet, good. Season same as Wealthy.

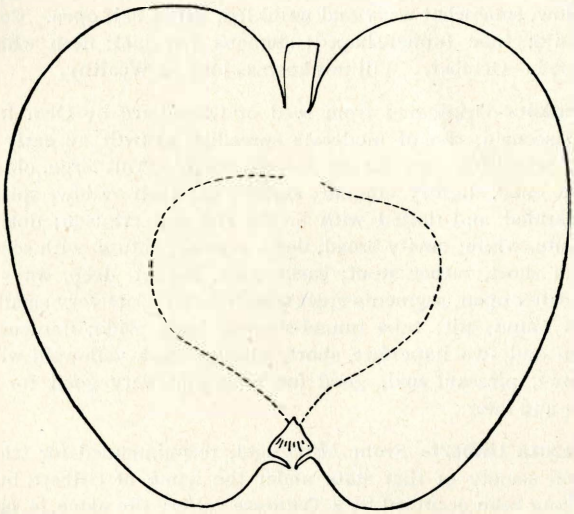
McIntosh (McIntosh Red)—A choice variety of the Fameuse type; origin, Ontario, Canada; tree vigorous, with spreading head, a good annual bearer—Fruit above medium to large, roundish oblate to roundish truncated, slightly irregular and obscurely angular, highly perfumed; surface very smooth, polished, yellow, almost wholly covered with brilliant solid crimson, the coloring brighter on shaded side, with heavy blue bloom, a beautiful fruit; dots many, obscure, minute, white; cavity obtuse, wide, regular, with a trace of russet; stem short to medium, stout; basin smooth, rather shallow, abrupt; calyx closed, segments connivent. Core close, cells ovate, entire; tube funnel-shaped; stamens marginal or median; seeds plump; flesh snow-white, crisp, very tender, juicy, sprightly aromatic subacid, very good. December to January.



McMahon.
(*McMahon White*)

McMahon (*McMahon White*)—Origin, Richland County, Wisconsin, about 1860, it is claimed from seed of Alexander; it is doing well in Wisconsin and parts of southern South Dakota and Minnesota, but is not a first-class shipper, as the skin is tender, and shows bruises readily; tree a very strong grower and a good bearer—Fruit large to very large, roundish, some-

what conical, obscurely angular and irregular; surface light yellow, becoming almost clear white when fully ripe, often with delicate blush; dots white, large, suffused; cavity deep, acute, russeted; stem short to medium, stout; basin medium deep, wavy, narrow; calyx open, segments divergent. Core closed, irregular, sessile; tube obtusely conical; stamens basal; flesh white, coarse grained, crisp, juicy, sprightly subacid, good for table, very good for cooking. October to December.



Malinda.

Malinda—Originated by Mr. Rollins, of Orange County, Vermont; named for one of his daughters, introduced into Minnesota by his son, J. W. Rollins, of Elgin, Minnesota, about 1858 or 1860. Tree a slender straggling grower in nursery, and tardy bearer; tree has done well in northern Iowa and southern Minnesota and bears early when top-grafted on Hibernal apple or Virginia crab. In the Station orchard at Brookings, young trees of Malinda top-grafted on Whitney crab killed back very severely in winter of 1898-99—Fruit above medium to large, sharply conical, somewhat angular, and ribbed; surface smooth, rich yellow, with dull red blush; dots minute, white, distinct, numerous; cavity acute, medium, regular, with stellate russet patch; stem short, stout; basin narrow, abrupt, wavy, corrugated, deep; calyx closed. Core closed, meeting; tube conical; stamens median; flesh yellowish white, firm, juicy, very mild subacid, with sweet after taste, fair. Late winter.

Mallett (No. 980)—Origin, Russia—Fruit large to very large, roundish, somewhat oblate, sometimes unequal; surface greenish yellow, mostly covered with mixed and marbled red, with short crimson splashes; dots white, minute, numerous, some areolar; cavity russet and green, shallow; stem me-

dium; basin wavy, wrinkled; calyx closed or half open. Core closed; flesh white, coarse grained, juicy, subacid; good. September, October.

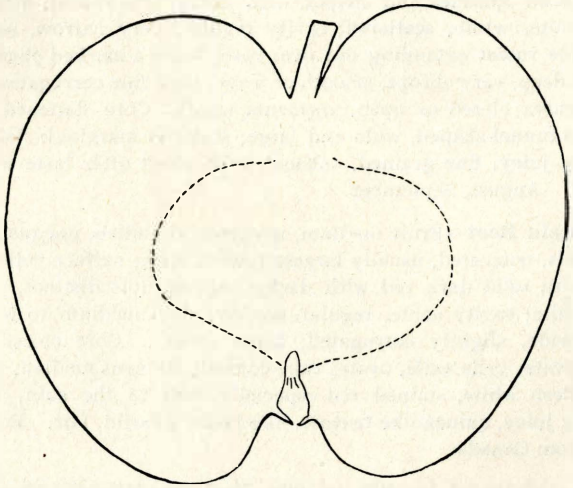
Mills—Grown by Whitney Mills, Litchfield, Minnesota, from Transcendent crab, seed furnished by L. E. Day. Tree very upright, a good annual bearer—Fruit medium, regular, roundish; surface yellow, striped and splashed red (Duchess type of coloring); dots minute, white, very obscure; cavity regular, acute, with radiating patch of russet; stem medium; basin wide, shallow, somewhat wavy and wrinkled; calyx half open. Core closed, nearly sessile; tube funnel-shaped; stamens marginal; flesh white, juicy, subacid, good. October. Will not keep as long as Wealthy.

Milwaukee—Originated from seed of Oldenburg by Geo. Jeffry, Milwaukee, Wisconsin; tree of moderate spreading growth, an early and good bearer. A promising new variety for the north—Fruit large, oblate, much flattened at ends, slightly angular; surface greenish yellow, splashed and striped, marbled and dotted with bright red and crimson; dots obscure, many, minute, white; cavity broad, deep, regular, obtuse, with some stellate russet; stem short, rather stout; basin wide, abrupt, deep, wavy, slightly wrinkled; calyx open, segments erect convergent. Core very small, slightly open; cells round, slit; tube funnel-shaped, long, wide; stamens median; seeds seven and two imperfect, short, plump; flesh yellowish white, very tender, juicy, pleasant acid, good for table and very good for cooking. Mid winter and later.

Minnesota Gilbert—From Minnesota, recommended for trial by the horticultural society of that state under the name of Gilbert, but as this name has long been occupied by a Tennesse variety the name is modified as above—Fruit medium, regular, oblate to very oblate; surface greenish yellow, mostly covered with mixed red, with dark crimson splashes and stripes, much like a highly colored Oldenburg; dots distinct, numerous, gray, rather large; cavity regular, wide, with radiating light yellow russet; stem short; basin regular, wide, shallow, smooth, or with a few minute wrinkles or prominences around calyx; calyx wide open, segments convergent. Core closed, small, clasping, sessile; cells axile, round, slit; tube funnel-shaped; stamens median; seeds very large, flat; flesh white, juicy, sprightly subacid, good; use culinary. August to September. Origin not definitely known. All my correspondents agree in that it first came to notice in the orchard of the late E. B. Jordan, near Rochester, Minnesota. Prof. Green is inclined to think it may be some Russian variety renamed. Mr. Brand writes that Gilbert appeared as a top-grafted tree; Mr. Jordan secured a large lot of varieties from Illinois and top-grafted. Mr. Wedge writes that its origin is not positively known; might have been a Russian variety or a seedling; season later than Duchess and near enough like it to sell for it in the market.

Mitchell's Red Warrior—Originated in 1869 or 1870, at Cresco, northern Iowa, by J. B. Mitchell. Tree hardy and very productive—Fruit above medium to large, roundish, slightly conical, regular; surface light yellow

nearly covered with bright mixed red and crimson, heavily and distinctly striped and splashed with carmine, a beautiful fruit; dots obscure, few, very minute, white; cavity regular, narrow, acute, slightly russeted; stem short; basin narrow, very abrupt, wavy; calyx open, segments erect convergent. Core closed; cells ovate, slit; tube funnel-shaped; stamens median; seeds few, flattened, long pointed, medium; flesh white, juicy, pleasant subacid, good. Season same as Wealthy. A good apple, but the present name is too long.



Mitchell's Red Warrior.

Mollie—Specimens from R. H. L. Jewett, Fairbault, Minnesota. Origin, Minnesota—Fruit large, roundish, somewhat conical and angular, irregular, somewhat ribbed; surface yellowish green, yellow on sunny side; dots distinct, numerous, minute, white; cavity regular, narrow, acute, faintly russeted; stem very short; basin shallow, corrugated, with heavy ribs extending out over base, and irregular prominences; calyx closed, segments erect convergent. Core open; cells obovate, widely slit, many slits with white exudate; tube conical; stamens basal; seeds few, very plump and blunt, almost rounded; flesh white, juicy, acid. November.

Moscow—Origin, Russia. As received by A. G. Tuttle, Baraboo, Wisconsin, of the Yellow Transparent type—Fruit very small, roundish oblate, slightly five sided; surface yellow, nearly transparent, becoming white at maturity; dots minute, greenish, numerous; cavity medium, abrupt; stem long to very long; basin wide, shallow, wrinkled; calyx closed. Core large; tube conical; flesh white, juicy, sprightly subacid, good. July and early August.

Moscow (No. 380)—Origin, Russia. A beautiful appple of Lowland Raspberry type—Fruit medium or below, roundish oblate; surface smooth,

striped, splashed and marbled bright crimson and carmine; dots white, minute, scattered, very obscure; cavity rather shallow, mostly a little russeted; stem short, stout; basin irregular, folded and wrinkled; calyx closed. Core closed; seeds short, plump, closely packed in cells; flesh white, fine grained, very juicy, subacid, very good. Table or kitchen. Early August.

Mottled Anis (13 M)—Origin, Russia—Fruit medium or below, oblate, regular, often unequal; surface yellow, mostly covered with fine dark crimson broad splashes and stripes, with heavy blue bloom; dots very obscure, minute, white, scattered; cavity regular, very narrow, acute, with considerable russet extending out over base; basin a marked characteristic, broad and deep, very abrupt, smooth or wavy, with fine corrugations around the eye; calyx closed or open, segments small. Core flattened, regular, open; tube funnel-shaped, wide and large; stamens marginal; flesh yellow, moderately juicy, fine grained, subacid, with sweet after taste when fully ripe, good. August, September.

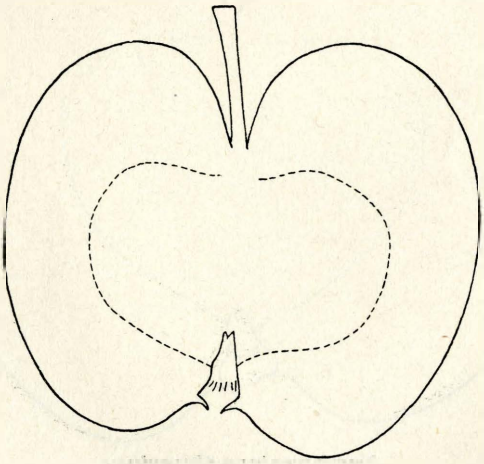
Mountain Beet—Fruit medium, irregular, roundish, unequal, tapering to both ends, truncated, usually largest toward apex; surface yellow, nearly covered with solid dark red with darker stripes; dots distinct, numerous, minute, white; cavity acute, regular, narrow; stem medium to long; basin shallow, wide, slightly corrugated; calyx closed. Core closed, distant, roundish ovate; cells axile, ovate; tube conical; stamens median; seeds few, pointed; flesh white, stained red especially next to the skin, firm, only moderately juicy, quince-like texture, like Haas, subacid, fair. Fall. Trees received from Canada.

Ness—Originated in 1869 or 1870 by J. B. Mitchell, Cresco, Iowa. Original tree low, rather dwarf, very prolific—Fruit medium, oblate, regular; surface greenish yellow, nearly or entirely covered with a fine dark red, with dark crimson stripes, well colored specimens nearly solid dark red, with blue bloom; dots distinct, very numerous, very minute, white, sharply defined; cavity acuminate, regular with considerable stellate russet; stem short; basin wide, shallow, smooth; calyx open, or half open; segments erect convergent, large, broad; flesh subacid, good. Early summer.

Newell (*Orange Winter*)—Originated over fifty years ago in Sauk County, Wisconsin, by Orange Newell from seed of Perry Russet brought from New York—Fruit large, roundish oblate, irregular, angular; surface a rich yellow, with faint bronze blush on sunny side; dots green, minute, with numerous russet dots; cavity wide, deep, ribbed; stem short; basin wide, ribbed, rather deep; calyx half open. Core closed, meeting, tube funnel-shaped; stamens median; flesh firm, juicy, yellowish, rich, sprightly subacid, very good. All winter.

Noregon (*Mitchell's* 4 A)—Originated at Cresco, northern Iowa, in 1869 or 1870, by J. B. Mitchell: "As productive as Duchess and resembling it in tree, but a more robust grower." Name condensed from "New Oregon."—Fruit above medium, roundish, slightly conical, truncated, often

incllned; surface whitish yellow, mostly covered rather thinly with bright crimson stripes and splashes and mixed red on sunny side; dots very obscure, few, whitish, minute; cavity deep, narrow, acute, with stellate russet, the rays sometimes extending out over base; stem short; basin narrow, shallow, slightly wrinkled around the eye; calyx half open, segments erect convergent. Core closed; large, sessile, clasping; cells ovate, entire; tube funnel-shaped, long, narrow; stamens marginal; seeds few, large, long, pointed; flesh very white, slightly stained with red next the skin, satiny, tender, juicy, pleasant subacid, very good. Late fall.

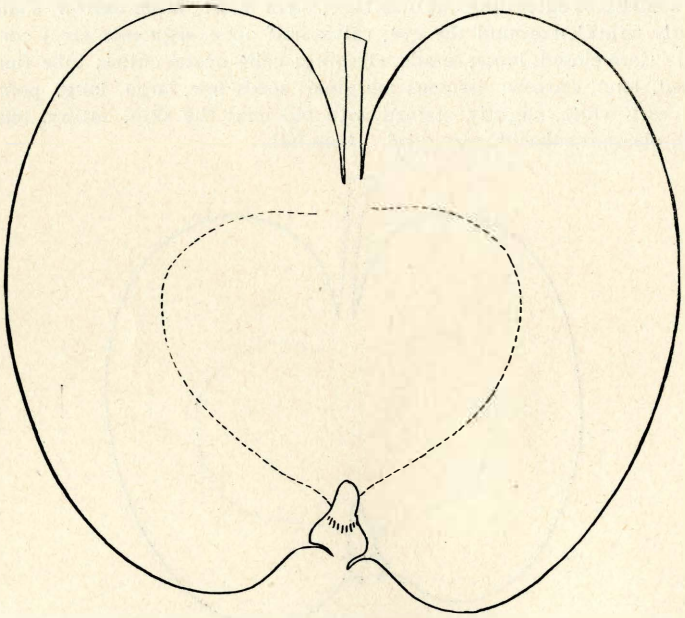


North Star.

North Star—Originated by C. G. Patten, Charles City, Iowa—Fruit medium or below, roundish truncated, very regular; surface polished, clear waxen yellow, with warm, reddish bronze blush; dots distinct, numerous, white, minute; cavity regular, obtuse. considerable stellate russet; stem medium; basin wide, shallow, slightly corrugated in bottom around the eye; calyx half open, segments broad. Core large, yellow outline sharply defined; cells round, slit; tube conical, long, wide; stamens median; seeds few, very large, flat, short, blunt; flesh yellow, juicy, fine grained, firm, sprightly acid, good. Late fall. For the eastern variety named North Star see Dudley *Winter*.

Northwestern Greening—Origin, Waupaca County, Wisconsin, introduced in 1872 by E. W. Daniels—Fruit large to very large, roundish oblong, slightly conical, truncated, regular; surface yellowish green, unctuous; dots white, small, some with gray bases, a few large russet dots; cavity regular, deep, acute, sometimes slightly russeted; stem rather short; basin regular, finely wrinkled around the eye; calyx open. Core closed, clasping; tube funnel-shaped, broad; stamens median; flesh greenish yellow, firm, juicy,

subacid, good. All winter. J. S. Harris: "It does a little better top-worked on hardy stocks, i. e., crabs and hybrids." (Minn. Hort. Rep., 1895, p. 155.)



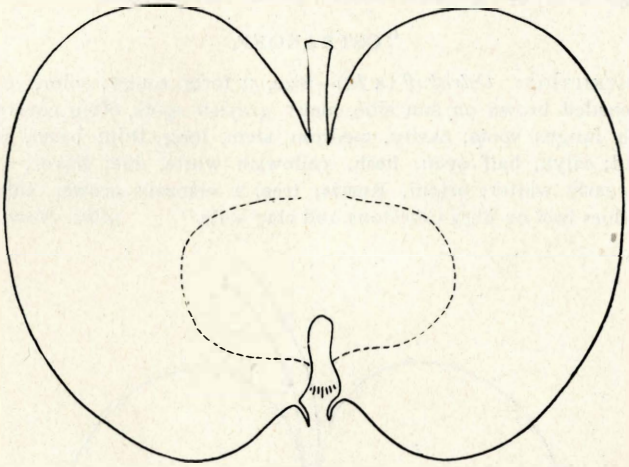
Northwestern Greening.

Oakton—Fruit medium, regular, oblate; surface greenish yellow, with short splashes and dots of dull crimson; dots dark, minute, numerous; cavity regular, slightly russeted; stem short; basin abrupt, regular, wavy; calyx closed, segments divergent. Core quite small, open, clasping; flesh white, fine grained, juicy, subacid, good. Late winter. In old orchard, Iowa Experiment Station.

Ohligee—A number of seedlings originated from seed of Duchess by Mrs. Ohligee, Winnebago City, Minnesota, about twenty-eight years ago. The latest in season is No. 14 which is now in propagation. See Superb.

Okabena—Originated on the banks of Lake Okabena, near Worthington, Minnesota. A seedling of Duchess fertilized by the Wealthy from seed furnished by Peter M. Gideon in 1871. Tree an annual and abundant bearer, hardy at this Station—Fruit large, regular, oblate; surface yellow, striped and splashed with red, sometimes covering the entire surface, on sunny side mixed and marbled with dark crimson stripes and splashes, a handsome fruit; dots minute, scattered, white, obscure; cavity regular, deep, sometimes russeted; stem variable; basin a marked characteristic, wide, rather shallow, regular, sometimes abrupt; calyx closed. Core small, closed, clasping; tul e

long, broad, funnel-shaped; stamens marginal; flesh white, fine grained, sometimes stained, juicy, subacid, very good. December.



Okabena.

Okeroe—Specimens from F. J. Peterson, Waconia, Minnesota; scions received from Sweden, "upright grower, about as hardy as Duchess."—Fruit below medium, roundish conic, irregular; surface polished, yellow, almost covered with dark red, solid and mixed in sun, many short dark crimson splashes; dots obscure, few, white; cavity wide, nearly flat, regular, few faintly lipped; stem long; basin very shallow, wide, smooth; calyx closed, segments connivent. Core wide open; cells abaxile, ovate, slit; tube funnel-shaped, narrow; stamens marginal; seeds rather small, not many, some imperfect; flesh white, fine grained, pleasant, rich subacid, sweet after taste, very good. Late fall.

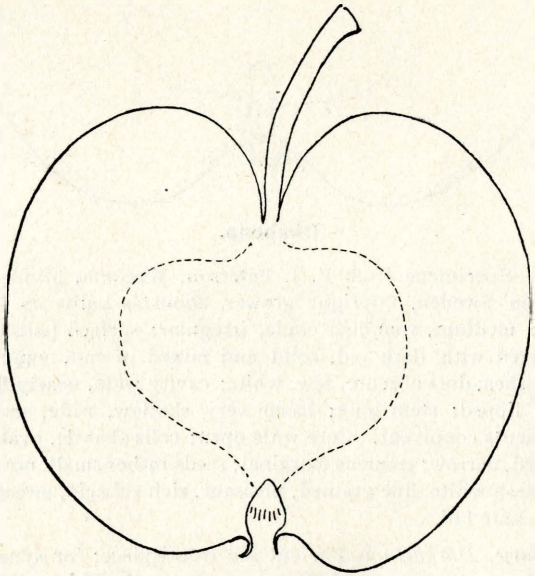
Oldenburg, *Duchess of*—For cut see frontispiece; for synonymns and allied varieties see Duchess and "Duchess Group." This well known Russian variety is the hardiest of the old list; its endurance of severe winters encouraged the importation of other sorts from Russia—Fruit large, roundish oblate, regular; surface smooth, greenish yellow, almost wholly covered with stripes and splashes, mixed on sunny side with crimson, a handsome fruit; dots white, numerous, minute; cavity deep, regular, acute, small radiating patch of russet in bottom; stem short to medium; basin abrupt, regular, small protuberances around the eye; calyx closed, segments long, broad, connivent. Core closed; cells ovate, axile; tube funnel-shaped; stamens basal; flesh white, sprightly acid, good. August, September.

Ostrakoff (No. 4 M)—Origin, Russia—Fruit medium or above, round, slightly conical, unequal; surface yellow, approaching white; dots white, minute, suffused, obscure; cavity regular, acute; stem very long; basin nar-

row, rather shallow, corrugated; calyx closed, segments erect convergent. Core closed; cells ovate, entire; tube broadly conical; stamens median; flesh yellowish white, fine grained, subacid, good. Early winter.

"OSTRAKOFF.

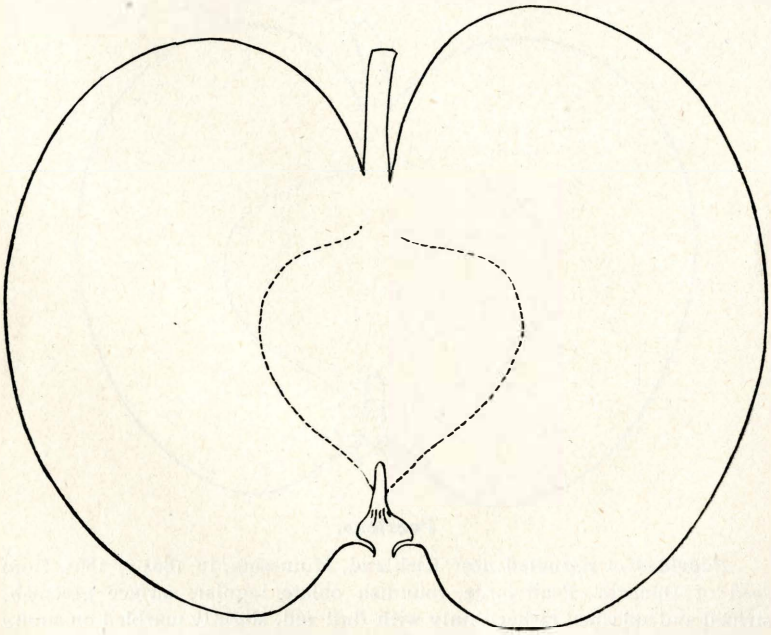
DESCRIPTION: *Ostrakoff* (4 M)—Size, 5; form, round; color, yellowish green, shaded brown on sun side, many grayish spots, often covered with blackish fungus spots; cavity, medium; stem, long, thin; basin, shallow, wrinkled; calyx, half open; flesh, yellowish white, fine; flavor, subacid: season, early winter; origin, Russia; tree, a vigorous grower, subject to blight, does best on high limestone and clay soils." (*Rus. Nom. Com.*)



Ostrakoff.
(No. 4 M)

Ostrakavis (*Ostrakoff X Ben Davis*)—One out of several seedlings of same parentage originated at Iowa Experiment Station about 1888. Ostrakavis may serve as a name suggesting the parentage, in case the variety proves valuable under propagation. Interesting as showing that a cross of two sour apples may produce a sweet apple—Fruit medium or below, conical, regular; surface oily, color yellow, with faint bronze blush; cavity regular, deep, obtuse, with faint trace of russet; basin wide very shallow, minutely wrinkled. Core wide open, meeting; cells large, roomy, ovate, slit; tube funnel-shaped; stamens median; seeds twelve, large, plump; flesh white, sweet. Season probably late fall or early winter.

Oxford Orange—Specimens from the originator, Wm. Oxford, Freeburg, Minnesota—Fruit medium, regular, roundish oval; surface smooth, polished, a clear yellow, with faint blush; dots minute, suffused, obscure, some large white areolar dots; cavity deep, narrow, funnel-shaped with stem completely filling the tube of funnel; stem short; basin narrow, abrupt, finely wrinkled, rather shallow, calyx closed, segments connivent. Core open, meeting; cells obovate, slit; tube funnel-shaped or conical; stamens basal or marginal; seeds many, short, plump; flesh white, firm, fine grained, mild, pleasant, rich subacid, very good. Winter.

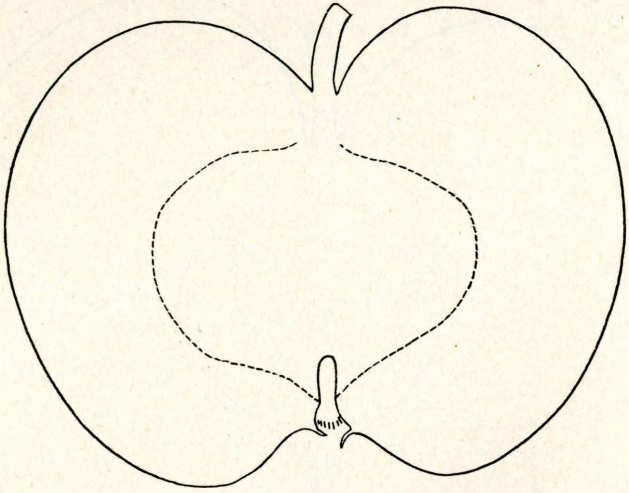


Patten Greening.
(*Duchess* No. 3)

Patten Greening (*Duchess* No. 3)—A seedling of Oldenburg; seed grown near Portage, Wisconsin, and planted in fall of 1869, by C. G. Patten, Charles City, Iowa; tree productive, of somewhat stronger growth than Oldenburg, with limbs strongly shouldered. The Minnesota State Horticultural Society has recently put it on the list recommended for general cultivation as of first degree of hardiness—Fruit large, roundish oblate, irregular, obscurely angular; surface yellowish green, with bronze blush; dots minute, white, mostly with green bases on shaded side; cavity regular, acute, russeted; stem short to very short; basin broad, slightly wavy, abrupt; calyx open. Core closed, small, clasping; tube narrow, funnel-shaped; stamens median; flesh white, juicy, sprightly subacid, good for table, excellent for

cooking. October to January. At state fair displays the green dots readily distinguish this variety from McMahon which has white dots.

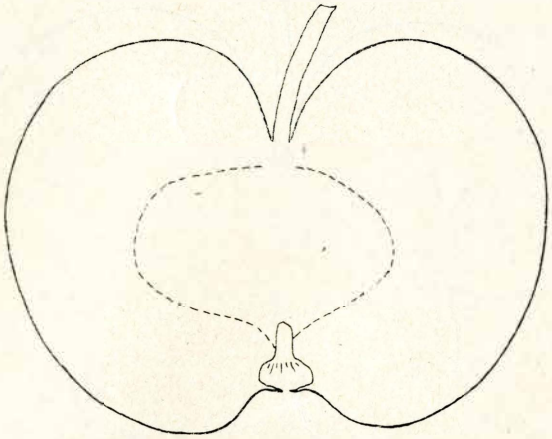
Peach (*Canada Peach, Montreal Peach*)—Fruit medium, oblong to conical; surface yellow, sometimes bronze blush; dots white, suffused; cavity regular, acute, russeted; stem medium to long; basin narrow, corrugated; calyx closed; segments large, erect convergent. Core closed; clasping; tube funnel-shaped; stamens marginal; flesh white, fine grained, juicy, acid, good. Summer, about the same as Oldenburg.



Peerless.

Peerless—Originated near Richland, Minnesota, in 1864 or 1865, from seed of Duchess—Fruit large, roundish oblate, regular; surface greenish, striped and splashed rather thinly with dull red, slightly marbled on sunny side; cavity wide, with radiating green (a characteristic); stem short; basin wide, usually abrupt and wavy; calyx closed or half open. Core closed, clasping; cells round, slit; tube funnel-shaped; stamens marginal; seeds eight to ten, long, pointed, rather slender; flesh firm, juicy, pleasant subacid, good. Late fall, early winter. The seed which produced the Peerless was grown by Geo. Dorrance, Rice County, Minnesota, and planted by John Geo. Miller of same county.

Peffer's Duchess X Rall's Genet — Originated by the late Geo. P. Peffer, Pewaukee, Wisconsin. Specimens from E. H. S. Dartt, Owatonna, Minnesota—Fruit medium, regular, oblate; surface yellow, covered rather thinly with dull red splashes and stripes, mixed, overlaid with whitish; dots white, very minute, nearly invisible; cavity regular, russeted; stem medium; basin abrupt, wrinkled; calyx closed. Core closed, clasping; tube funnel-shaped; stamens median; seeds large, flat; flesh white, juicy, fine grained, rather spicy, rich, pleasant subacid, very good. Winter.



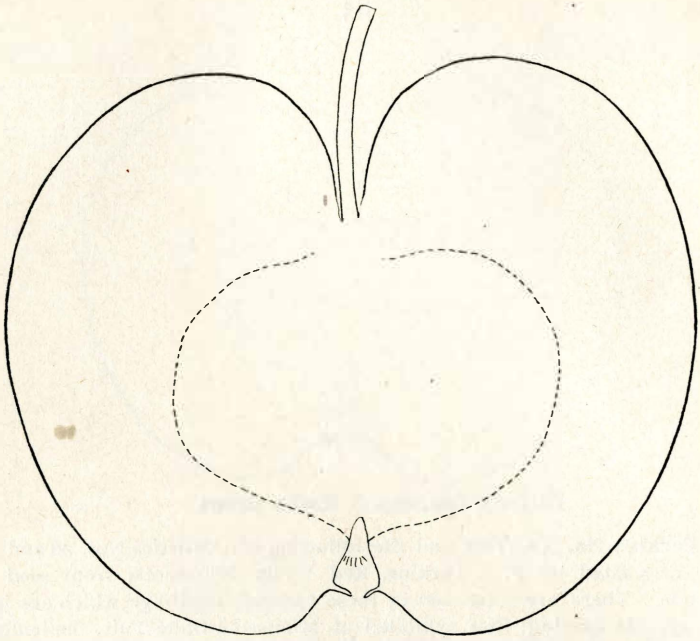
Peffer's Duchess X Rall's Genet.

Perkins No. 32—This and the following two varieties Nos. 46 and 78, were originated by F. I. Perkins, Red Wing, Minnesota, from seed of Malinda. There are some 200 of these Malinda seedlings which are just coming into bearing; first exhibited at Minnesota State Fair, September, 1902*. The fine display certainly was such as to encourage similar efforts--Fruit above medium, regular, conical; surface green, with red stripes; dots white, numerous; cavity regular, slightly russeted; stem medium, stout; basin narrow, slightly ribbed, abrupt; calyx closed. Core wide open, meeting; cells roomy, elliptical, slit; tube conical; stamens basal; seeds fifteen, small, plump; flesh fine grained, pleasant subacid, good. Winter.

Perkins No. 46—Origin, see Perkins No. 32--Fruit medium, roundish oblate, regular, somewhat ribbed and angular; surface greenish yellow, thinly covered with mixed dark red, indistinctly splashed; dots gray, minute, numerous, distinct; cavity green, regular, wide, obtuse; stem medium; basin wide, shallow, wrinkled. Core closed; cells round, slit; tube conical; stamens basal; seeds eleven, plump; flesh yellowish white, firm, fine grained, pleasant subacid, good. Winter.

Perkins No. 78—Origin, see Perkins No. 32—Fruit large to very large, very regular, roundish oblong, slightly conic; surface polished, waxen yellow, almost wholly covered with brilliant dark red with darker crimson splashes and stripes, a showy fruit; dots obscure, very minute, many, whitish; cavity narrow, acuminate, deep, with patch of stellate russet; stem long; basin shallow, wrinkled, regular; calyx closed, segments connivent. Core half open, clasping; cells roomy, ovate, slit; tube conical; stamens median; seeds twelve, plump; flesh white, faintly stained next to skin; juicy, tender, sprightly acid, good. Earlier than Wealthy.

*The publication of this Bulletin was delayed so as to include the new fruits of 1902.



Perkins No. 78.

Perry Russet—Origin, Perry, New York. Tree moderate, spreading, upright growth.—Fruit medium, oblate to roundish oblate, somewhat conical, regular; surface a rich golden yellow, covered more or less with open net-work of russet, some specimens are quite free from russet, or at least as grown in the west; dots distinct, many, large; cavity wide, obtuse, regular, usually with much stellate russet, sometimes lipped; stem short to medium; basin medium deep; abrupt, wrinkled, often corrugated; calyx open, segments divergent. Core closed, barely clasping; cells ovate, axile, slit; tube conical; stamens median; seeds plump, rather small; flesh yellow, firm, fine grained, rich, juicy, brisk subacid, very good. December to February.

Peter—Originated from seed of Wealthy by the late Peter M. Gideon, Excelsior, Minnesota. In fruit this appears nearly if not quite identical with Wealthy. Mr. Gideon himself could not distinguish the two varieties by the fruit, but claimed Peter was hardier in tree. The seeds of the Peter are large, broad and plump, about ten in number; calyx segments connivent; tube conical and stamens median. In Wealthy the tube is funnel-shaped; stamens median or basal. Wyman Elliott of Minneapolis, one of the most prominent members of the Minnesota Horticultural Society, after a careful examination of many specimens finds the Wealthy seeds smaller and more pointed; the Peter seeds larger, broader, less pointed and a little darker when fully ripe. Even if really distinct, the two varieties are now mixed to a considerable extent.

Peterhof—Origin, Russia. Specimens from F. I. Harris, LaCrescent, Minnesota—Fruit small, oblong conic, irregular, angular and ribbed; surface polished, pale waxen yellow almost wholly covered a brilliant dark red, distinctly splashed and striped dark crimson, a beautiful fruit; dots obscure, minute, white, many; cavity regular, acuminate, with large radiating patch of russet; stem medium; basin shallow, almost flat, abrupt, corrugated and ribbed; calyx closed, segments erect convergent. Core closed; cells ovate, slit; tube conical; stamens marginal; seeds eight, and some imperfect, small, plump; flesh white, considerably stained with red, moderately juicy, subacid, fair. August.

Peterson Seedling—Originated by F. J. Peterson, Waconia, Minnesota; first crop 1901—Fruit large, roundish, truncated, slightly tapering; surface shaded and striped with rich bright red, nearly solid on sunny side, color thinner on shady side; dots distinct, many, minute, white; cavity regular, large, wide, deep, slightly russeted; stem long; basin abrupt, wavy. Seeds few, flattened; flesh white, stained with red next to skin, juicy, pleasant subacid, good. Late fall.

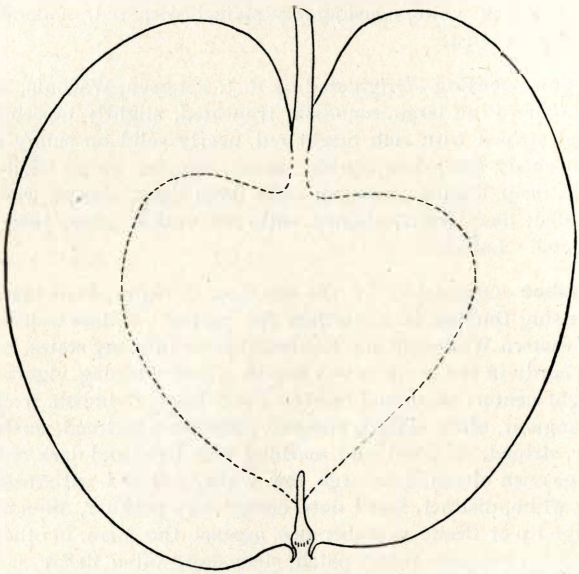
Pewaukee—Originated by the late Geo. P. Peffer, Pewaukee, Wisconsin, by crossing Duchess with Northen Spy pollen. It does well in the lake section of eastern Wisconsin and has found favor in many states, but has not proved as hardy in the north as was hoped. Tree of strong, vigorous growth with upright center; an annual bearer—Fruit large, roundish, irregular and variable, angular, often ribbed, unequal, sometimes inclined; surface greenish yellow, striped, splashed and marbled with light and dark red, overlaid with thin grayish bloom; dots large, few, white, suffused, with russet centres; also many white, distinct, small dots; cavity very peculiar, often nearly flat, with a large lip or fleshy protuberance against the stem, in others shallow and wavy, with irregular russet patch; stem short, often fleshy at insertion, basin shallow, wavy, ribbed, rather narrow, angular; calyx half open. Core half open, distant, clasping; tube funnel-shaped; stamens median; seeds about twelve, plump, small; flesh yellowish white with yellow veinings, a little coarse, juicy, subacid; good. All winter.

Pineapple (No. 988)—Origin, Russia—Fruit small, conical, angular; surface yellow; dots white, distinct, minute, some areolar; cavity wavy, ribbed; stem long, stout; basin very shallow, often flat, wrinkled; calyx large, segments large. Core open, large; seeds twelve, large, light brown; flesh white, subacid. Late fall.

Pipka (No. 369)—Identical with Flat Miron (No. 467).

Plumb Cider—Introduced by the late J. C. Plumb, Milton, Wisconsin. Mr. Plumb, in 1874, said that it was brought from Ohio, in 1844, to Wisconsin, by his father; "that the original tree, planted by him, in Jefferson County, still stands, a model of form and fruitfulness." Tree vigorous, round-headed, an early bearer, very productive in alternate years—Fruit

above medium, roundish oblong, conical, ribbed, angular, sometimes furrowed, unequal; surface greenish yellow, thinly shaded with light red, with darker bright red splashes and stripes on sunny side; dots minute, white, obscure; cavity acute, narrow; stem short; basin very shallow, narrow, wrinkled, wavy; calyx closed. Core open, clasping, cordate; tube long, very narrow, funnel-shaped; stamens extremely marginal, touching the segments, a marked characteristic; seeds many, short, plump, pointed; flesh greenish white, firm, fine grained, juicy, brisk subacid, good. October to January.



Plumb Cider.

Pointed Pipka (No. 361)—Origin, Russia—Appears to be identical with Charlamoff; a valuable variety for the far north.

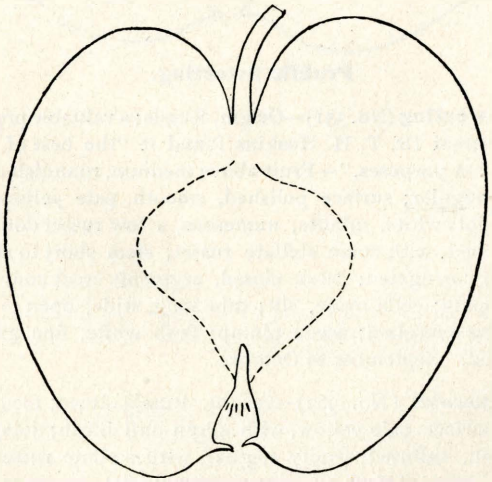
Polisher Herrenapfel—Origin, Russia—Fruit medium or above, regular, oblate, truncated; surface unctuous at maturity, yellow, mostly covered with dark red, rather solid coloring, slightly mixed, with dark crimson splashes; dots obscure, minute, white, few; cavity wide, regular, russeted; stem medium; basin (marked characteristic) wide, very abrupt, with small prominences around the eye. Core closed; flesh white, subacid, good. October.

Potainoe (No. 106 M)—Origin, Russia, appears closely related to Yellow Transparent type—Fruit above medium to large, very regular, round, oblate, truncated; surface clear waxen yellow becoming white; dots large, numerous, areolar, consisting of minute russet centers with large white bases;

cavity regular, wide, much russeted; stem short, stout; basin wide, shallow, regular, with prominences around the eye; calyx closed, segments large, long. Core closed; tube wide, funnel-shaped; stamens marginal; flesh yellowish, fine grained, firm, juicy, good. August.

Pound (No. 360)—Origin, Russia—Fruit very large, heavy, roundish oblate, irregular, angular; surface deep yellow, mostly covered thinly with dull red, obscurely splashed, overlaid with whitish; dots obscure, few, yellow, minute; cavity regular, acute, considerable radiating russet; stem medium; basin smooth or minutely wrinkled; calyx wide open, segments divergent. Core half open, cells ovate, slit; tube funnel-shaped; stamens median; seeds very few, flattened, pointed, mostly imperfect; flesh white, juicy, acid, good for culinary use. September, October.

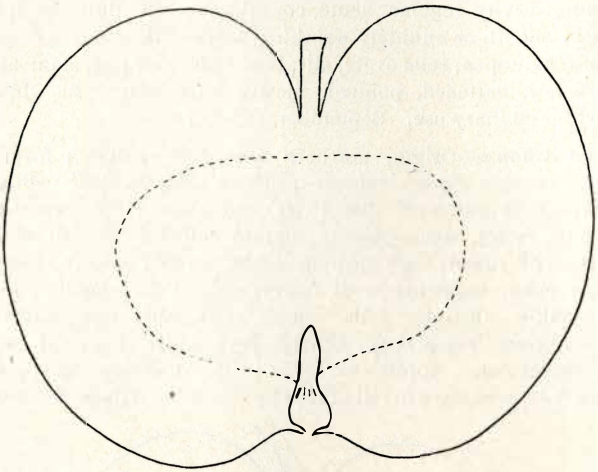
Prices Choice—Origin, northern Iowa—Fruit large; form regular, roundish, somewhat oblate; truncated; surface smooth, clear yellow, mostly covered with thin dotted red (like Utter) and obscure splashes and stripes; dots obscure, russet, some obscure minute suffused whitish dots; cavity regular, trace of russet; stem medium; basin narrow, smooth, abrupt, shallow; calyx open, segments erect convergent. Core closed, core outline greenish yellow, distinct; cells round, axile, slit; tube funnel-shaped; stamens marginal; seeds large, plump; flesh white, trace of red; good. October, November. Specimens from Chas. D. Price, Ruthven, Iowa. Originated from seed sown in fall of 1874 by Mrs. J. B. Wilson, Ruthven, Iowa.



Prices Sweet.

Prices Sweet—Of very strong, upright growth in nursery and orchard; subject to sun scald where stem is not protected; popular in parts of the west—Fruit medium, regular, oblong conical, often unequal; surface yellowish green, mostly thinly covered with mixed and marbled dull red, obscurely splashed and striped; dots large, distinct, numerous, russet, rough; cavity

slightly acuminate, deep, regular, with large patch of russet radiating out over base; stem medium to long; basin narrow, corrugated, shallow; calyx closed; segments erect convergent. Core half open; cells abaxile, elliptical; tube funnel-shaped; stamens median; seeds short, plump, few, crowded in cells; flesh yellowish white, moderately juicy, very sweet, good. September and October.



Prolific Sweeting.

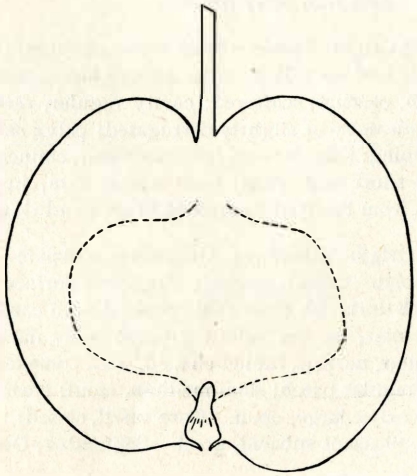
Prolific Sweeting (No. 351)—Origin, Russia; a valuable productive sweet apple. In Vermont Dr. T. H. Hoskins found it "the best of the fall sweet apples for market purposes."—Fruit above medium, roundish oblate, irregular, obscurely angular; surface polished, smooth, pale yellow, becoming a waxen white; dots white, minute, numerous, a few russet dots; cavity deep, acuminate, ribbed, with some stellate russet; stem short to medium; basin shallow, wide, corrugated; calyx closed, segments erect convergent. Core half open, clasping; cells ovate, slit; tube long, wide, open to core, funnel-shaped; stamens marginal; seeds plump; flesh white, fine grained, sweet, juicy, very good. September to October.

Queen Muscatel (No. 962)—Origin, Russia—Fruit medium, regular, round conic; surface pale yellow, with slight dull blush; dots obscure, few, minute, whitish, suffused; cavity regular, with stellate russet; stem short; basin shallow, corrugated; calyx open, segments flat convergent. Core half open; cells ovate, slit; tube conical; stamens median; seeds seven, long pointed; flesh white, juicy, sprightly subacid, good. Fall.

Ralls *Genet*—(Janet, Neverfail, Jeniton)—Origin, Amherst county, Virginia, on the farm of Caleb Rall; tree vigorous, spreading, very productive. It puts forth leaves and blossoms much later than other varieties and thus escapes late frosts—Fruit medium or above, oblate, conic, regular; sur-

face smooth, yellowish green, striped thinly with dull red, mixed red on sunny side; dots distinct, many, minute, white; cavity regular, acuminate; stem medium, stout; basin wide, smooth, shallow; calyx closed, segments connivent. Core closed, clasping, small; cells axile, ovate, slit; tube funnel-shaped; stamens median; seeds large, flattened; flesh whitish yellow, tender, juicy, sprightly subacid, very good. Late winter and spring. This is one of the hardier of the old eastern varieties, but not sufficiently so for the north; some near Vermillion, S. D., have done quite well.

Rambour Reinette (No 502)—Origin, Russia; tree very upright with large leaves—Fruit large, very irregular, oblate; surface greenish yellow; dots minute, white, areolar; cavity regular, medium; basin wide, irregular, folded and corrugated; calyx large, closed, segments convergent; flesh white, greenish veinings, very juicy, subacid, good. Fall. Also called Rambour Queen, Reinette meaning Queen.



Raspberry.

Raspberry (No. 288)—Origin, Russia; very productive; a good substitute for Red June where the latter winter-kills—Fruit small, oblong, obscurely angular, somewhat flattened at ends; surface a fine solid dark red (like a highly colored Red June); dots very minute, white, obscure, many; cavity regular, shallow to nearly flat, slightly russeted; stem medium to long; basin nearly flat with about five prominences around the eye; calyx closed; segments long, reflexed. Core open; cells ovate, slit; seeds short, plump, about twelve; flesh sprightly subacid, juicy, much stained throughout with the same beautiful color as the skin, very good. July, August.

Rattle (*Rattling Apple*, No. 441)—Origin, Russia—Fruit medium or above, roundish oblate, irregular, somewhat ribbed; surface a clear pale yellow, mostly covered with fine dark red, with a few obscure crimson

splashes; dots very obscure, few, minute, white; cavity regular, narrow, acute, with much radiating russet; stem short; basin much corrugated, ribbed; calyx closed; segments erect convergent, long. Core wide open; cells abaxile, elliptical, slit; tube conical; stamens marginal; seeds few, some imperfect, short, plump; flesh snow white, fine grained, tender, pleasant, sweet, very good. Fall.

Recumbent (Lejanka, 41 M)—Origin, Russia; nearly or quite identical with Hibernal and equally valuable, see Hibernal group--Fruit large, roundish oblate, somewhat angular; surface greenish yellow, partially and sparsely covered with broken stripes and splashes of dull red, the color is not solid but somewhat bronzed and mixed; dots russet, rough, scattered, a few white dots; cavity regular, medium, with much russet; the russet in most specimens radiating out all over the base; stem medium, stout, curved; basin wide, shallow, corrugated around the eye; calyx closed, segments erect convergent. Core open; tube long and very broad; stamens median; flesh juicy, acid, good for culinary. Late fall, early winter.

Red Ananas—Origin, Russia—Fruit below medium, oblong, truncated, almost cylindrical; surface yellow, with whitish bloom, no blush nor stripe; dots large. whitish, obscure, scattered; cavity regular, very acute, russeted; stem medium; basin wavy or slightly corrugated; calyx small, closed. Core closed, small, clasping; tube narrow, funnel-shaped; stamens marginal; seeds few, large, rather short and blunt; flesh white, firm, juicy, subacid, fair. August. Distinct from the Red Ananas of France and Germany.

Red Aport—Origin, Russia; of Alexander or Aport type—Fruit large, heavy; roundish oblate conical, unequal, irregular; surface greenish yellow, mostly shaded with dark red, obscurely splashed with carmine; dots obsure, minute, white, areolar, on the yellow ground many dark dots with light areola; cavity regular, narrow, funnel-shaped, with considerable russet, often radiating out in irregular patch; stem medium, stout; basin shallow, narrow, somewhat folded; calyx large, open. Core small, closed; tube conical; flesh firm, white, juicy, pleasant subacid, good. September, October.

Red Astrachan—Origin, Russia—First imported into England with the White Astrachan from Sweden in 1816. Tree of vigorous, upright, spreading growth, an early and abundant bearer—Fruit above medium, roundish, somewhat conical; surface smooth, greenish yellow, almost entirely covered with mottled, marbled and striped deep crimson, with delicate white bloom, a beautiful fruit; dots minute; cavity shallow, regular, obtuse, russeted; stem short: basin shallow, smooth, sometimes a little irregular; calyx small, closed. Core closed, barely clasping; cells open, obovate; tube funnel-shaped; stamens marginal or median; seeds many, angular, plump, small; flesh white, crisp, juicy, brisk acid, good. Late July, early August.

Red Cheek—As received from Minnesota, this appears nearly or quite identical with Raspberry. The name Red Cheek was at first applied to

Romianka, No. 445, but the two are very distinct; the name is also applied to several old eastern varieties.

Red Mushroom (No. 278)—Origin, Russia; a showy variety, much like Vasilis Largest and Zolotareff—Fruit very large, roundish to roundish oblong, cylindrical, obscurely angular, unequal; surface unctuous, colored like Vasilis Largest; dots obscure, minute, whitish, a few minute russet dots; cavity deep, acuminate, with much radiating russet; stem very short; basin ribbed, deep, abrupt; calyx open, segments erect, convergent. Core closed; cells ovate, slit; tube conical; stamens median; seeds few, short, plump; flesh white, fair, subacid; use, culinary. August.

Redpath Fall Seedling—Originated by Thomas Redpath, Long Lake, Minnesota; a seedling of a seedling of Northern Spy, awarded first prize at Minnesota State Fair in 1901 as a new fall Seedling—Fruit medium, roundish truncated; surface green, sparsely striped with red; cavity regular, acute, narrow, with faint trace of russet; stem medium; basin narrow, abrupt, nearly smooth; calyx closed. Core very small, rounded, meeting; cells obovate, slit; tube conical; stamens median; seeds very few; flesh subacid, good. Fall.

Red Pine (Red Duck No. 60)—Appears identical with Yellow Transparent.

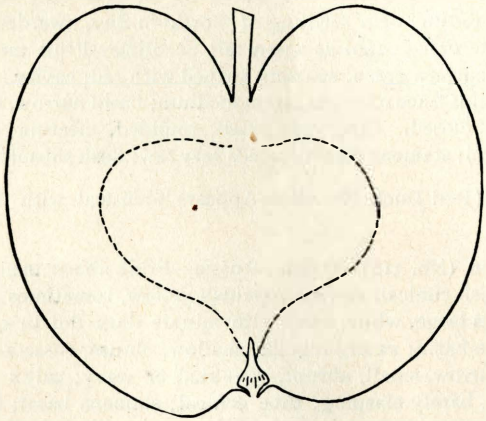
Red Queen (No. 316)—Origin, Russia—Fruit above medium to large, regular, roundish conical; surface greenish yellow, sometimes with dull reddish blush; dots large, white, some with minute dark dot in center, numerous towards the basin; cavity regular, shallow, obtuse, russeted; stem short, stout; basin narrow, small, abrupt, wrinkled or wavy; calyx closed. Core closed, distant, barely clasping; tube conical; stamens basal; flesh greenish white, with green veinings, sprightly acid, good for culinary use. Winter.

Red Sided (No. 142 M; 154 M)—Origin, Russia; very similar to Raspberry—Fruit small, regular, oblong truncated; surface a beautiful bright rosy red; dots minute, dark red, obscure, scattered; cavity regular, russeted; stem long; basin wide and very shallow, almost flat, with prominences around the eye; calyx closed, segments large, divergent. Core regular, closed; flesh white, stained red, fine grained, juicy, sprightly subacid, very good. August, ripens in succession.

Red Stettiner (*Rother Stettiner*)—Received from Russia, the name indicates German origin; tree not sufficiently hardy for general cultivation at the north—Fruit medium, very regular, round, somewhat truncated; surface green, almost wholly covered with solid dark, rather dull red; dots white, rather large, scattered; cavity wide, very shallow, acuminate, green, sometimes russeted; stem very short, extremely fleshy; basin very wide, regular, shallow; calyx closed or half open, segments very small. Core outline green, mostly open; cells small; tube long, funnel-shaped; stamens median; seeds plump, short, many imperfect; flesh greenish white, firm, juicy, mild, vinous, sweet subacid, very good. All winter.

Red Warrior—See Mitchell Red Warrior.

Red Wine—From Russia; of Lowland Raspberry type—Fruit medium, roundish oblate, irregular, sides often bulging; surface polished, waxen white, almost wholly covered with bright red, a beautiful fruit; dots distinct, numerous, minute, white; cavity regular, narrow, with stellate russet; stem medium; basin shallow, narrow, wrinkled and corrugated; calyx closed, segments connivent. Tube funnel-shaped; stamens median; flesh snow white, tender, juicy, subacid, good. August, September. Red Wine is No. 343, Rother Weinapfel; this suggests German origin.



Repka Malenka.

Repka Malenka—Origin, Russia. Malenka means small. This is probably the best keeper of the Russians. A. G. Tuttle of Baraboo, Wisconsin, finds the fruit keeps easily until June—Fruit below medium, conical to roundish conical, obscurely angular, somewhat irregular and unequal; surface yellow, striped, splashed, mixed and dotted dull red on sunny side; dots obscure, few, very minute, white; cavity regular, obtuse, with considerable radiating russet; stem medium to long; basin abrupt, narrow, shallow, slightly corrugated and wrinkled; calyx open or closed, segments erect convergent, very long. Core closed, clasping; cells round; tube funnel-shaped, sometimes linear (long and very narrow); stamens marginal or median; seeds about ten, large, plump, packed tightly in the small cells; flesh white, firm, mild subacid, good. Late winter and spring.

"REPKA MALENKA GROUP.

Repka Malenka, 410; Little Seedling; Green Sweet; 169, (spurious).

DESCRIPTION: *Repka Malenka*—Size 4; form, round, conical, angular; color, light green, striped with dull red; cavity, deep, russeted at the bot-

tom; basin, narrow, abrupt, wrinkled; calyx, closed; flesh, greenish white, firm; flavor, mild, subacid; season, January to April; origin, Russia; tree, upright, symmetrical and of rather slow growth.

A. G. Tuttle: Repka Malenka with me bears early and keeps until apples come again. I find it is fully as good a keeper as Little Romanite and a much better apple in quality." (*Rus. Nom. Com.*)

Revel Pigeon (No. 123)—Origin, Russia; tree upright with large leaves —Fruit medium to large, regular, round oblate, conic; surface very smooth and waxen, clear greenish yellow, becoming white, with light red splashes and stripes on sunny side; dots large, scattered, white, very obscure; cavity regular, medium, with small irregular patch of russet; stem quite long and stout, sometimes fleshy ridge; basin small, very shallow, fine wrinkles around the eye; calyx closed, segments large. Flesh white, breaking, juicy, sprightly subacid, very good. Last of July and first of August.

Richland Beauty—Originated from seed of Duchess grown by Geo. Dorrance, in Rice County, Minnesota, and planted and grown by John Geo. Miller of same county, about 1867—Fruit medium, regular, oblate; surface greenish yellow, striped with red; cavity wide, regular, obtuse, *green* with trace of russet; stem short; basin somewhat ribbed and corrugated, abrupt; calyx closed, segments erect convergent. Core closed; cells round, slit; tube funnel-shaped; stamens marginal; seeds very large, packed tightly in cells, about nine; flesh white, pleasant subacid, good. Fall.

Riepovka (No. 323)—Origin, Russia—Fruit above medium, roundish oblate, irregular, unequal, furrowed and ribbed, sometimes approaching oblong, truncated, variable in form, but the ribs are generally well marked around the cavity and basin; surface yellow, with red and crimson stripes and splashes; dots minute, white, obscure, numerous; cavity regular, slightly russeted, acute; stem very short, stout; basin wide, shallow, folded, with irregular corrugations; calyx large, closed, segments large. Core regular, clasping, closed; tube conical; stamens marginal; flesh white, firm, juicy, fine grained, sharp acid. For cooking only. Fall.

Riga Stripe—Origin, Russia—Fruit large, roundish truncated, somewhat conical, regular; surface smooth, yellowish green, nearly covered with a beautiful crimson, with carmine stripes and splashes (a beautiful fruit); dots obscure, few, gray; cavity regular, deep, acute, often with much stellate russet; stem short to medium; basin very peculiar, smooth, deep, very abrupt or cup-shaped; calyx half open, segments erect convergent. Core closed, sessile; cells axile, round, entire; axis short; tube funnel-shaped; stamens basal; seeds plump, rounded; flesh white, with green veins, firm, juicy, mild, rich, spicy, subacid, very good. Late fall.

Rollins Pippin—Origin, Minnesota; one of the early seedlings that does not appear to be increasing in popularity—Fruit above medium, roundish oblate, regular; surface greenish yellow; dots minute, white, obscure, with a few minute russet dots; cavity regular, acuminate, usually with radi-

ating patch of russet; stem long, deeply inserted; basin rather shallow, with fine wrinkles. Core open, clasping; tube conical; stamens median; seeds ten to twelve; plump; flesh white, juicy, fine grained, subacid, fair, good for cooking. Winter.

Rollins Prolific—Origin, Minnesota—Fruit medium, roundish conical, regular; surface yellowish green; dots minute, white, often with green areola, often a few russet dots; cavity wide, regular, slightly acuminate; stem short; basin flat, a few slight wrinkles; calyx closed. Core closed, clasping; tube funnel-shaped; stamens marginal; seeds ten to fourteen, a few abortive, plump; flesh white, juicy, fine grained, brisk subacid, good. Winter.

Roman Stem—Origin, Burlington, New Jersey. Tree very productive, of moderate vigor, spreading, irregular. One of the hardiest of the old eastern varieties for central and northern Iowa; the size and color are against it for market—Fruit medium or below, roundish, often irregular and unequal; surface smooth, rich yellow, with faint bronze blush, sometimes with patches of russet, and a few reddish specks; dots distinct, many, russet or green, size variable, mostly small; cavity wide, shallow, obtuse, usually with a large lip or fleshy protuberance against the stem, this is typical of the variety although occasionally absent; stem short; basin narrow, abrupt, wavy, somewhat corrugated; calyx closed, segments erect convergent. Core closed, barely clasping; cells ovate, slit; tube conical; stamens median; seeds many, plump, pointed; flesh yellow, with yellow veinings, tender, juicy, spicy, rich subacid, excellent. November to March.

Romianka (No. 445)—Fruit medium, roundish oblong, faintly angular; surface yellow, rather thinly striped and splashed crimson, the coloring dulled by a whitish bloom; dots white, minute, obscure; cavity acuminate, regular, with radiating patch of russet; stem long; basin broad, nearly flat, corrugated; calyx half open, segments large. Core closed; tube conical; stamens median; seeds few, small; flesh white, peculiar spongy texture, juicy, subacid, fair; use chiefly culinary. Fall. Of Russian origin.

Romna (No. 599; *Romenskoe*)—Origin, Russia—Fruit large, very regular, roundish conical; surface smooth, green, with faint bronze blush; dots distinct, many, large, gray; cavity regular, acute; stem medium, stout; basin narrow, wrinkled, very shallow; calyx closed. Core closed, clasping; tube funnel-shaped; stamens median; flesh white, firm, pleasant subacid, good. Late winter and spring.

"ROMNA GROUP.

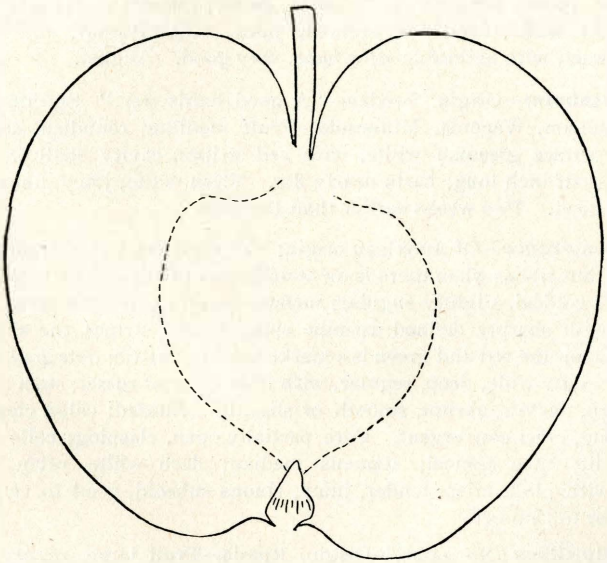
Romna, 599; Romenskoe. The large, round, green winter apple as grown by Mr. Tuttle, of Wisconsin, under the name of Romenskoe, will hereafter be known as the true Romna. This settles the matter definitely, as Hibernal has been mixed with Romna as originally sent out from Russia.

DESCRIPTION: *Romna*—Size, 6; form, smooth, round, conical, very regular; color, dark green with brownish red on sun side, covered with grayish bloom, thickly sprinkled with large grayish dots; cavity, acute, deep, regular; stem, medium and stout, often knobbed; basin, shallow, narrow, wrinkled; calyx, closed; flesh, white, fine grained; flavor, mild, pleasant acid; season, late winter and spring; tree, spreading, irregular, dwarf.

A. G. Tuttle: Romna is a good apple, but not one of the first dozen varieties that I would plant. It keeps till April or May, but does not get good until April. Tree has an irregular top and is a slow grower.

C. G. Patten: I regard Romna as the most valuable of all the Russians from which to grow seedlings with the hope of getting winter varieties.

J. Sexton: Romna is a fine apple. The tree is spreading and has the largest leaf of any that we have." (*Rus. Nom. Com.*)



Romna.

Rosenhager—Origin, Russia—Fruit medium, roundish oblate, somewhat conical, sometimes broadly furrowed; surface yellow, mostly covered with bright rosy crimson stripes and splashes on sunny side, overlaid with whitish net-veining; dots few, obscure, light gray, some distinct with dark centres; cavity regular, obtuse, deep, with trace of russet; stem short; basin shallow, wide, corrugated and ribbed; calyx small, open, segments divergent. Core open, clasping; cells ovate, abaxile, slit; tube broadly conical; stamens median; seeds flat, often imperfect, long, pointed; flesh white, with faint yellow veinings, fine grained, crisp, juicy, mild, pleasant subacid, very good. Late winter.

Roxanna—Origin, Wisconsin—Fruit medium, conical, irregular, angular; surface yellow, wholly covered with a fine crimson and carmine splashes (much like a well colored Fameuse), a handsome fruit; dots white; cavity regular, slightly russeted, acute; stem short; basin very shallow, narrow, wrinkled; calyx half open. Core closed, clasping, very large; tube short, conical; stamens marginal; seeds very plump, light brown; flesh white, fine grained, mild subacid with sweet after taste, very good. Winter.

Russian Gravenstein (spurious No. 105)—Origin, Russia; two varieties were imported under the above name, one of which appears to be Antonovka and the other is as follows—Fruit medium, regular, oblate; surface polished, light yellow, mostly covered with lively red and crimson stripes and splashes; dots few, obscure, white, minute; cavity regular, wide, slightly russeted; stem short to medium; basin medium, abrupt, regular, or slightly wavy; calyx closed, segments long, acute. Core regular, closed; tube very broad, long, as in Serinkia, funnel-shaped; stamens marginal; flesh snow white, firm, fine grained, juicy, very pleasant, mild subacid; almost sweet, with agreeable after-taste, very good. August.

Safstaholm—Origin, Sweden—"A good hardy tree." Specimens from F. J. Peterson, Waconia, Minnesota—Fruit medium, roundish, somewhat conical; surface greenish white, with red stripes; cavity shallow, obtuse; stem one-half inch long; basin nearly flat. Flesh white, juicy, fine grained, subacid, good. Two weeks earlier than Duchess.

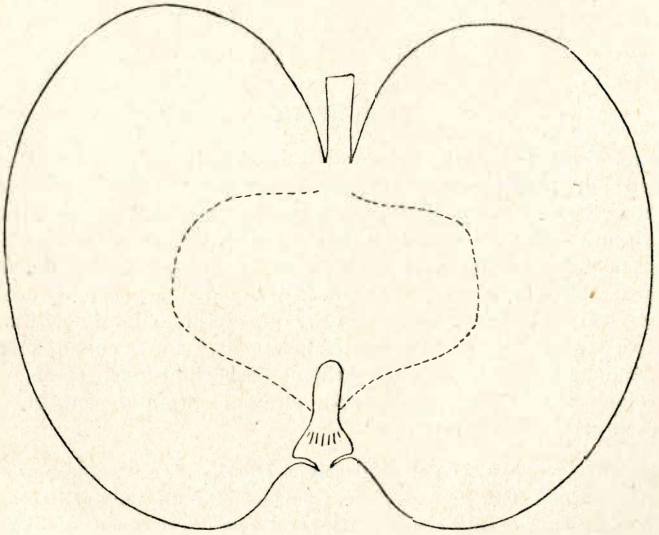
St. Lawrence—Of American origin; tree vigorous, upright, productive, valuable, but ripens when there is an abundance of fruit—Fruit large, oblate, somewhat conical, slightly angular; surface smooth, yellowish green, mostly covered with sharply defined carmine splashes and stripes, the sharp contrast between the red and green is a marked characteristic; dots gray, minute, obscure; cavity wide, deep, regular, with faint trace of russet; stem medium; basin deep, narrow, abrupt, smooth or slightly wrinkled; calyx closed, segments long, erect convergent. Core partially open, clasping; cells obovate, widely slit; tube conical; stamens median; flesh white, often slightly stained with pink, crisp, tender, juicy, vinous subacid, good to very good. September to October.

Sandy Glass (No. 24 M)—Origin, Russia—Fruit large, regular, oblate to roundish oblate; surface green, with bronze or dull red blush and white bloom, part of the bloom remains permanent as a thin scattered net-veining of grayish white; dots distinct, numerous, greenish white, prominent, a few large russet dots, with white bases; cavity deep, acute, regular, with slight trace of stellate russet; stem short; basin very wide, shallow, regular, wrinkled; calyx closed, segments very small. Core closed, small, meeting, regular; cells ovate, entire; tube conical; stamens marginal; seeds numerous, rather large, short, plump; flesh white, juicy, brisk acid, good. Early winter.

Saxonian (No. 437)—Origin, Russia—Fruit medium, roundish oblate, slightly conical, obscurely angular; surface yellow, thinly striped and

splashed red; dots obscure, minute, white, many; cavity deep, regular, obtuse, with a large patch of radiating russet extending out over the base; stem medium; basin abrupt, with minute wrinkles; calyx closed, segments connivent. Core closed, clasping; cells round, slit; tube funnel-shaped; stamens marginal; seeds large, short, very plump; flesh white, acid, use culinary. August.

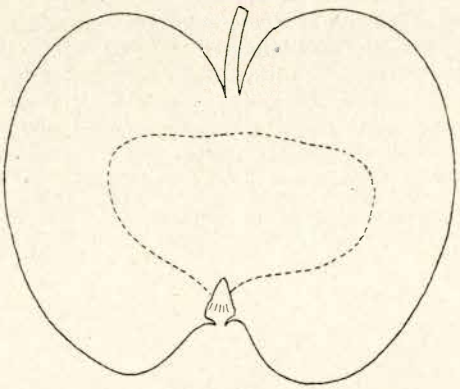
Saxton (*Fall Stripe*)—An old variety of Massachusetts or Connecticut origin; is also raised in parts of the west; tree vigorous, round-headed, an early bearer, very productive alternate years—Fruit medium, roundish, truncated, somewhat irregular and obscurely ribbed; surface greenish yellow, thinly washed with light red, with distinct dark red stripes and splashes, mixed red on sunny side; dots minute, white, obscure; cavity acute, slightly russeted; stem medium to long; basin wide, shallow, often flat, ribbed and wrinkled; calyx closed, segments erect convergent. Core wide open, meeting or barely clasping; cells round, roomy, abaxile, slit; tube funnel-shaped; stamens median; seeds many, short, plump, easily loosened so as to rattle when shaken; flesh yellowish, juicy, tender, mild subacid, good to very good. September.



Schroeder.
(*Tuttle's Charlamoff; the upright Charlamoff*)

Schroeder (*Tuttle's Charlamoff; the upright Charlamoff*)—Received from Russia under the name of Charlamoff, but the tree is of upright habit and fruit very distinct from that variety. The above name was given by the Russian Nomenclature Commission in 1898—Fruit large, roundish oblate, flattened at ends, regular; surface handsomely colored, much like Oldenburg,

splashes broad, bright, distinctly defined; dots obscure, gray, few, very minute; cavity deep, wide, regular, with much stellate russet; stem short; basin medium, somewhat corrugated and minutely wrinkled; calyx open. Core half open; cells round or roundish ovate, entire; tube long, wide, funnel-shaped, open to core; stamens marginal; seeds short, plump; flesh white, juicy, acid, good. September. See Charlamoff and "Charlamoff group." Recently it appears that more attention should be given this variety.



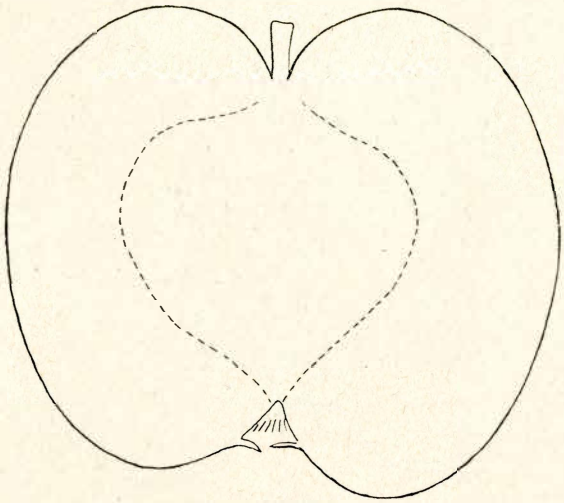
Scott Winter.

Scott Winter—Origin, Vermont; introduced by Dr. T. H. Hoskins. Tree a strong, upright grower; an annual and good bearer. Promising at the north—Fruit medium or below, roundish oblate, conical, somewhat angular; surface a rich yellow, heavily washed with red, with indistinct dark stripes and splashes and some open russet net-veining, giving the fruit a peculiar marbled, dark orange red color; cavity regular, deep, obtuse, with stellate russet; stem short; basin narrow, very abrupt, slightly wrinkled or wavy; calyx closed, segments erect convergent. Core closed, clasping; cells round; tube conical; stamens median; seeds eight to ten, short, plump; flesh yellow, fine grained, juicy, crisp, pleasant sprightly acid, good; use chiefly culinary. Late winter.

Serinkia (No. 337),(*Grayest*)—Origin, Russia—Fruit medium or above, regular, roundish, somewhat flattened; surface smooth, pale yellow, mostly covered with crimson splashes and stripes, mixed and marbled; dots obscure, minute, white, few; cavity regular, wide; stem short, stout; basin small, very shallow (a marked characteristic); calyx large, closed. Core open, clasping; tube wide, long, broadly funnel-shaped, open to the core; stamens marginal; seeds small; flesh white, fine grained, very juicy, sprightly subacid, good. All of August.

Sheriff (*American Beauty*, incorrectly)—Brought from Pennsylvania many years ago by James Sheriff, hence its name; the original name having

been lost. Tree quite hardy in parts of the west. Tree vigorous, of tall, open, somewhat spreading, symmetrical habit, with few branches; a good annual and early bearer—Fruit medium, roundish, somewhat cylindrical, flattened at ends, nearly regular; surface pale greenish yellow, nearly covered with light and dull dark red, with obscure carmine stripes and splashes; dots many, minute, distinct, whitish; cavity very narrow, acuminate, regular, green and russeted; stem medium to long, slender, deeply inserted; basin wide, shallow, wavy, or slightly ribbed; calyx closed, segments erect convergent. Core closed; cells ovate, slit, very large; tube funnel-shaped; stamens median; seeds few to many, plump, pointed; flesh whitish, juicy, tender, mild pleasant subacid, not rich, good. December, February.



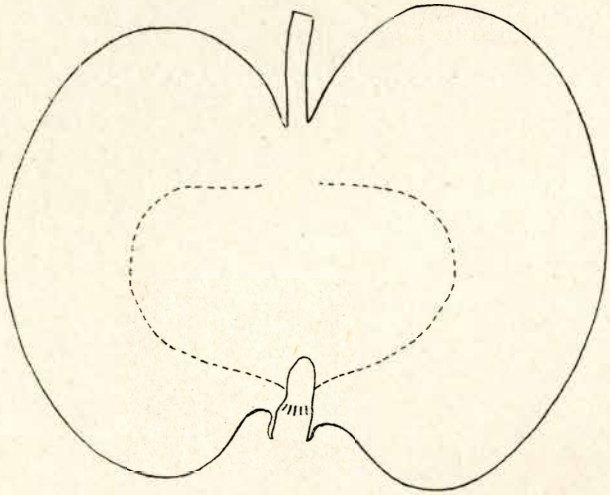
Sheriff.
(*American Beauty*, incorrectly)

Simbrisk No. 9—Origin, Russia; a large variety of Yellow Transparent type received from Simbrisk, Russia—Fruit large, oblong conical; slightly unequal and oblique; surface rich yellow, becoming white, almost transparent; dots very large, few, areolar or suffused; cavity acuminate, russeted; stem medium, deeply inserted; basin wavy, abrupt; calyx large, half open, segments short. Core closed, barely clasping; tube broadly conical; stamens median; seeds plump; flesh whitish, with green veinings, firm, moderately juicy, subacid, good for cooking. Early fall.

Sklanka—Origin, Russia; specimens from Dewain Cook, Jefferis, Minnesota. Much like Grandmother—Fruit large, nearly regular, roundish oblate, conical; surface yellow, with bronzed red on sunny side; dots obscure, numerous, minute; cavity narrow, regular, acuminate, large radiating patch of russet out over base; stem short, deeply inserted; basin abrupt,

smooth, nearly cup-shaped; calyx open, segments large, divergent. Core closed, meeting; cells ovate to roundish ovate, entire; tube conical; stamens basal; pistils long and stout; flesh whitish, acid, good for cooking. Late fall.

Smoky Arcad (No. 864; No. 60 M)—Origin, Russia—Fruit medium, round, oblate, regular, some specimens slightly tapering and angular around the eye; surface smooth, greenish yellow, with white bloom, no blush nor stripes, some specimens with a bronze cheek in sun; cavity narrow, very acute; stem short; basin small, regular, abrupt; calyx closed; segments erect convergent. Core closed; tube conical; stamens marginal; seeds about ten, plump, packed tightly in cells; flesh white, firm, sweet, very good. Last half of July and first half of August.



Speer.

Speer—A stray variety in some scions of another variety received from Russia. Named in honor of R. P. Speer, Cedar Falls, Iowa, by the Iowa State Horticultural Society—Fruit above medium to large, roundish, somewhat oblate, regular; surface rich golden yellow, remarkable for the numerous minute prominences and raised dots; dots obscure, many, minute; cavity regular, obtuse, slightly russeted; stem medium, stout; basin smooth, wide, deep, very abrupt, forming a cup with a few prominences in bottom; calyx closed, segments erect convergent, very large and leafy. Core closed, clasping; cells axile, ovate; tube funnel-shaped; stamens marginal; flesh white, juicy, crisp, sprightly acid, good. Late fall.

Stenkyrka—Origin, Sweden—Fruit small, roundish oblate; surface yellow, mostly thinly covered with red stripes covered with whitish net-veinings; dots distinct, numerous, gray, large; cavity obtuse, wide, regular; stem short, stout; basin flat, corrugated, very woolly; calyx closed, segments large, divergent. Core open; cells obovate, entire; tube funnel-shaped;

stamens basal; seeds long, pointed; flesh white, juicy, subacid, good. Winter.

Streaked Naliv (*Juicy Streaked, No.* 330)—Origin, Russia—Fruit medium, oblong, slightly conical, obscurely angular; surface yellowish white with pale blush; dots minute, many, russet; cavity wide, regular, some stellate russet; stem medium, stout; basin shallow, corrugated; calyx closed segments connivent. Core half open; cells round, slit; tube funnel-shaped; stamens marginal; seeds few, plump; flesh white, pleasant subacid, good. August.

Sumnoi Kalville—As imported from Russia; this appears identical with the Christmas No. 310, now grown in Minnesota; also with Scented White, No. 136 M and Crooked Spike, No. 159 M—Fruit medium, regular, oblong, sharply conical, sometimes roundish oblate, but always tapering sharply to the basin; surface unctuous, delicate, yellowish white, mostly covered with mixed and marbled rosy red with broken splashes of darker red, the color is much interspersed with whitish net-veining giving it a very characteristic marbled appearance; dots obscure, white, numerous; cavity regular, medium, russeted; stem medium to long; basin very peculiar, flat with corrugations and ribs around the eye; calyx closed, segments small, divergent. Core open, clasping; cells very large; tube long, conical; stamens marginal; seeds long, pointed; flesh white, tender, fine grained, juicy, spicy, subacid, very good for table. Late fall.

Superb (*Oligher No.* 14)—For history see Oligher—The Minnesota variety here described needs re-naming as the name Superb is already occupied by an old North Carolina variety. Oligher No. 14 was propagated for a time by the late J. S. Harris under the name of Dr. Hume. Description from specimen from S. D. Richardson, Winnebago City, Minn.—Fruit large, oblate, regular, truncated; surface a clear yellow; dots very obscure, few, minute, whitish; cavity regular, narrow, deep, acuminate, with stellate russet; stem very short, deeply inserted; basin wavy, abrupt, medium deep, rim wide, rounded; calyx open, segments divergent. Core closed, clasping; tube conical; stamens marginal; seeds few, rounded, plump; flesh white, tender, juicy, pleasant, sprightly acid, good. Winter.

Sweet Borovinka (*No.* 874)—Origin, Russia—Fruit medium, roundish oblate, somewhat conical, irregular, somewhat angular and ribbed; surface yellow, with some dull red stripes and splashes, broken, scattered and well defined, not marbled or mixed; dots white, obscure, minute, suffused; cavity regular, acute, with much russet; the russet is a marked characteristic, it fills the entire cavity often extending out over entire base; stem very short; basin rather wide, shallow, corrugated; calyx large, closed, segments large, long, divergent. Core closed, clasping; tube large, long, funnel-shaped; stamens marginal; seeds plump, short, closely packed in cells; flesh white, firm, moderately juicy, very sweet, good. August.

Sweet Longfield (20 M)—Origin, Russia; an excellent late summer sweet apple, following Smoky Arcad and Beautiful Arcade in season. The

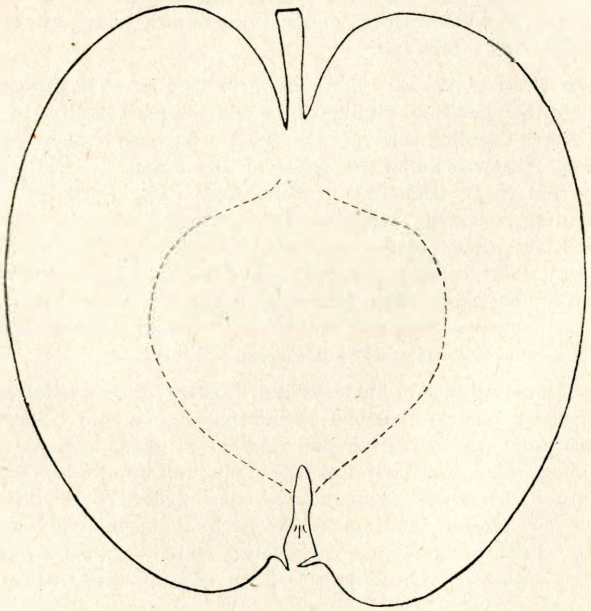
original name, Kursk Reinette, was changed to Sweet Longfield by Prof. Budd and this was adopted by the Russian Nomenclature Commission—Fruit large, regular, oblong conic, somewhat truncated; surface greenish yellow, often with faint blush on sunny side; dots minute, white, obscure, numerous, slightly raised; cavity regular, acute, slightly russeted; stem medium; basin small, abrupt, slightly wrinkled; calyx closed, segments small. Core regular, clasping, open; cells large; tube conical; stamens median; seeds small, plump; flesh white, fine grained, rich, sweet, very good for table or baking. August.

"SWEET LONGFIELD.

DESCRIPTION: *Sweet Longfield*—Size, 5; form, oblong, somewhat oblique; color, yellow with blush on sun side, dark dots; cavity, angular, broad, deep, russeted; stem, medium; basin, narrow, shallow, corrugated; calyx, closed; flesh, fine grained; flavor, sweet; season, early autumn; origin, Russia.

J. Sexton: Sweet Longfield we find is a hardy tree and a good bearer. It is a good sweet apple, and worthy of cultivation. The tree is rather spreading, does not resemble Longfield, and the foliage heavier than that of Longfield. It is the name now given to it instead of Kursk Reinette (20 M)."

(*Rus. Nom. Com.*)



Sweet Longfield.
(20 M)

Sweet Moscow (No. 35 M).—Origin, Russia; the original name was lost in transit; the above name is suggested. Sometimes mixed with Smoky

Arcad—Fruit medium or below, angular, roundish, conical, usually somewhat five-sided; surface polished, greenish yellow, becoming white, slightly roughened by the numerous, minute, white, raised dots; cavity regular, very acute, slightly russeted; stem short to medium, stout, rarely long; basin regular, very abrupt, fine wrinkles around the eye; calyx closed. Core closed; tube conical; stamens median; seeds few, packed closely in cells; flesh white, fine grained, firm, very sweet, excellent. Early August.

Sweet Pear (No. 965)—Origin, Russia—Fruit small to medium, round, truncated, slightly angular; surface yellow, blushed or bronzed pale dull red; dots minute, reddish on bronzed cheek; cavity wide, deep; stem long; basin small, very shallow, wrinkled; calyx closed. Flesh white, juicy, breaking, sweet, good. Early winter.

Sweet Pipka (No. 321)—Origin, Russia—Fruit medium or below, oblong conical, angular; surface smooth, clear yellow, becoming white at full maturity; dots very large, numerous, white, suffused; cavity regular, narrow, acute, abrupt, considerable russet spreading out in an irregular patch; stem short to medium; basin wide, shallow, slightly wrinkled; calyx closed; segments large, long, divergent. Core small, closed, barely clasping; cells abaxile; tube conical; stamens median; seeds few, short, plump, packed closely in cells; flesh firm, white, juicy, fine grained, sweet, good. September.

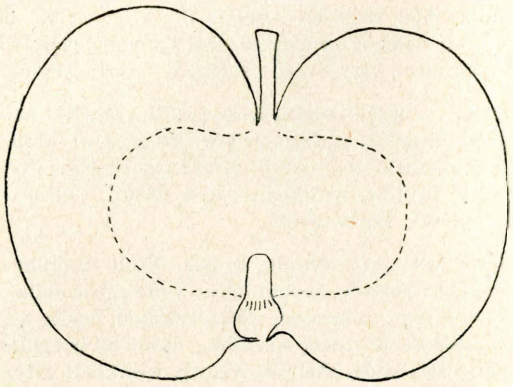
Sweet Wealthy—Originated from seed of Wealthy in 1874 by O. M. Lord, Minnesota City. Lord's Longfield came from the same lot of Wealthy seeds; others of these Wealthy seedlings produced "the sourest apples I ever tasted" (Mr. Lord). No sweet varieties were within range of the parent tree. Sweet Wealthy is an excellent fall sweet apple worthy of attention.—Fruit medium, roundish, often unequal; surface greenish yellow, thinly washed and obscurely splashed with dull red, overlaid with whitish; dots distinct, many, gray, minute; cavity regular, narrow, obtuse, with stellate russet; stem medium, fleshy, stout; basin flat, corrugated; calyx closed, segments erect, convergent. Core closed, rounded, clasping; cells ovate, slit; tube funnel-shaped; stamens marginal; seeds about ten, rather large, plump, pointed; flesh white, fine grained, juicy, pleasant, sweet, very good. September and October.

Switzer—Origin, Russia—Fruit medium, oblate, regular; surface light yellow almost or wholly covered with bright crimson; dots white, few, obscure; cavity regular, somewhat acuminate, russeted; stem long; basin wide, shallow, nearly flat, corrugated; calyx closed. Core half open, clasping; tube funnel-shaped, open nearly to core; stamens median; flesh snow white, firm, fine grained, rich, spicy, mild subacid, with sweet after taste, very good. September, October.

"SWITZER.

A. G. Tuttle and C. G. Patten reported that their trees had blighted to death. It appeared that, while esteemed by many growers in the east, it was too subject to blight in the northwest. It was thought that Switzer

should be struck off the list recommended by the American Pomological Society for planting in the northwest, and this opinion was ordered sent to the society for action at the next meeting." (*Rus. Nom. Com.*)



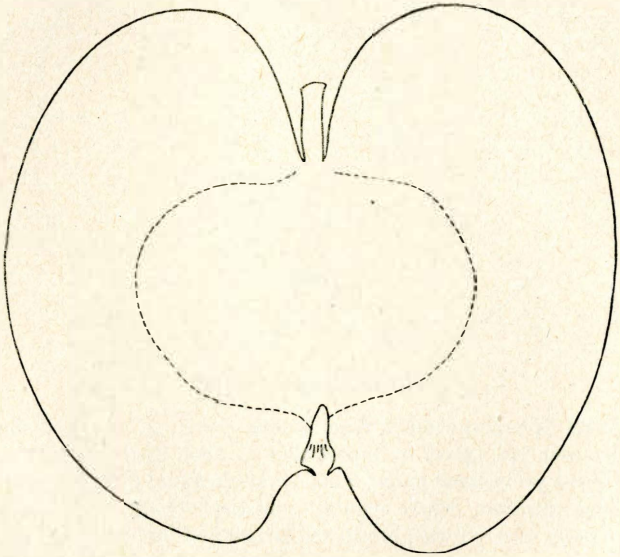
Tetofski.
(*Tetofsky*)

Tetofski (*Tetofsky*)—Origin, Russia; tree hardy, very upright, an early annual bearer—Fruit medium or below, oblate to roundish oblate, somewhat conical, angular; surface smooth, yellow, striped and splashed with bright crimson, marbled and mixed on sunny side, overlaid with heavy, whitish bloom, a handsome fruit; cavity wide, obtuse, regular; stem short to medium; basin shallow, much corrugated and ribbed; calyx closed, segments large. Core large, closed, clasping; cells obovate or round, slit; tube broad, long, funnel-shaped; stamens median; seeds plump; flesh white, juicy, sprightly acid, good. August.

Thompson (*Thompson's Seedling* No. 24)—Originated by J. S. B. Thompson, Grundy County, Iowa; an upright grower—Fruit large, roundish oval, irregular, somewhat unequal; surface yellow, with rosy crimson blush on sunny side; dots white, minute, obscure; cavity acute, deep, regular, slightly russeted; stem medium; basin narrow, small, abrupt; calyx open. Core wide open; tube funnel-shaped; stamens median; seeds numerous, loose in cells; flesh white, juicy, crisp, pleasant mild subacid, good. Late winter.

Thompson Seedlings—Originated by J. S. B. Thompson and wife Phoebe, Grundy County, northern Iowa. In fall of 1861, Mrs. Thompson saved the seed in her father's orchard of seedlings in New York. Out of about 400 seedlings, the following are named: Grundy, Harding, Judson, Thompson, Maple, Bremer, Soo, Humboldt, Tama, Phoebe; the first four are described here in proper order. Introduced by J. M. Underwood, Lake City, Minnesota.

Tiesenhausen—Origin, Russia; specimens from F. J. Peterson, Waconia, Minnesota—Fruit large, oblong conic, sometimes roundish conic; surface green, with some net-veined russet; dots distinct, many, green, minute; cavity very shallow, almost flat; stem very short, about one-half inch long, inserted half its length; basin shallow, corrugated; calyx closed, segments connivent. Core closed, meeting; cells elliptical; tube conical; stamens marginal; seeds very plump; flesh white, juicy, sprightly acid, fair; use culinary. Late fall.

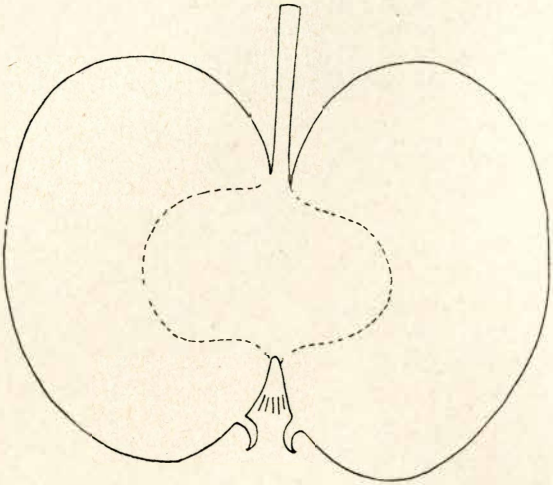


Titovka.
(*Titus Riga*)

Titovka (*Titus Riga*)—Origin, Russia; a large, beautifully colored apple, following Duchess in season—Fruit large, oblong, truncated, regular; surface smooth, very unctuous, yellow, mostly covered with fine marbled red, with carmine splashes and stripes; dots minute, white, obscure, few; cavity very deep, acute, yellow; stem very short; basin deep, very abrupt, with corrugations in bottom; calyx closed, segments small, erect convergent. Core wide open, sessile, clasping, roundish oblate; cells obovate, roomy, widely slit; tube funnel-shaped; stamens median; seeds few, short, plump, several minute imperfect seeds; flesh yellow, juicy, subacid, good. September, October.

Titovka Department—Imported from Russia by the U. S. Department of Agriculture—Fruit medium or above, roundish oblate, somewhat angular; surface smooth, yellowish green, mostly covered with distinct stripes and splashes of dark crimson, somewhat mottled; dots yellow, many, distinct; cavity deep, obtuse, regular, russeted; stem medium; basin rather deep,

wide, ribbed and corrugated. Core small, meeting, slightly open; tube funnel-shaped; stamens median; flesh whitish, firm, juicy, sprightly subacid, good. August. The above is suggested as a provisional name.

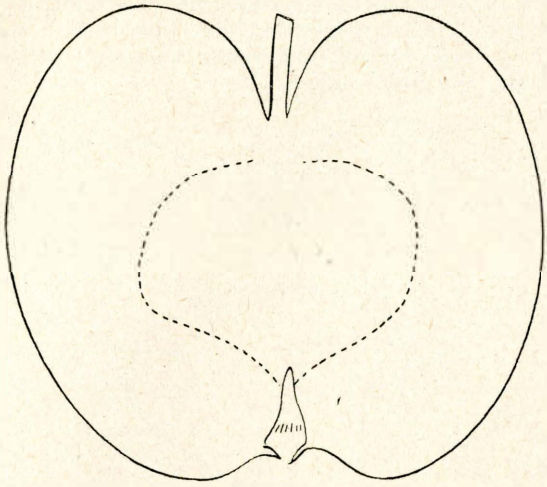


Titovka Department.

Titovka Speer—Received from Russia by R. P. Speer, Cedar Falls, Iowa; also found as a stray in importation by Prof. Budd. Titovka Speer is suggested as a provisional name; a good market apple; tree very productive—Fruit above medium, nearly regular, roundish oblong; surface clear pale yellow, mostly covered with bright red stripes and broad distinct splashes, a fine blue bloom; dots obscure, minute, whitish, few; cavity regular, deep, radiating russet patch; stem medium, sometimes rather long; basin obscurely ribbed, with prominences around the eye; calyx closed, segments very long, pointed. Core half open; cells ovate, entire; tube funnel-shaped; stamens median; seeds few, some imperfect, short, plump; flesh white, slightly, sometimes much, stained with red, very juicy, sprightly acid, good. August. Resembles Charlamoff (Peterson's) in form, color and blue bloom, but is only very slightly ribbed and angular.

Tolman Sweet (*Tallman Sweet*)—Origin, Rhode Island; tree vigorous; upright, spreading, very productive. One of the hardiest of the old eastern apples in the western prairie region—Fruit medium or above, nearly globular; surface whitish yellow, often with faint blush on sunny side, usually a distinct dark line or pin scratch runs from stem to calyx; dots, few, gray, minute, rather obscure, some with whitish bases; cavity rather wide, obtuse, medium deep, regular; stem long, slender; basin small, shallow, wrinkled, leather-cracked; calyx small, closed or half open; segments erect convergent. Core closed; cells ovate, slit; tube funnel-shaped; stamens median; seeds short, plump; flesh white, firm, moderately juicy, fine grained, rich, sweet; quality

very good for a sweet apple. All winter. The American Pomological Society recommends abbreviating the name to Tolman.



Titovka Speer.

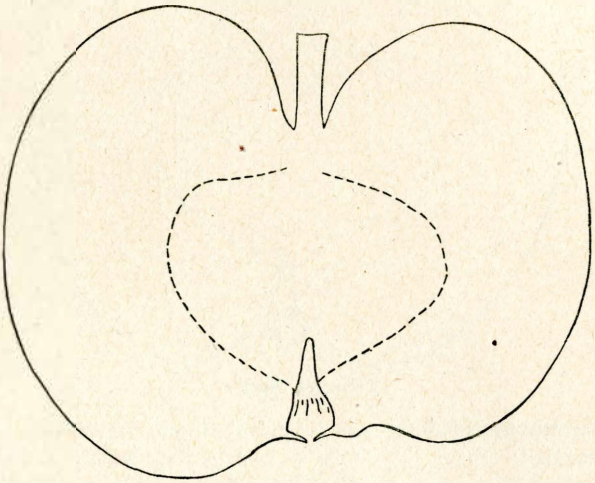
Transcendent Seedling—An unnamed winter apple raised from seed of Transcendent crab by the late J. S. Harris, LaCrescent, Minnesota, one of the foremost of western pomologists. This variety and the *Mills* indicate that large apples may be raised from Transcendent crab seed—Fruit medium, oblate, truncated, slightly angular; surface somewhat roughened by the dots, greenish yellow, thinly covered with mixed and striped dull red; dots obscure, minute, many, light russet; cavity wide, obtuse, deep, regular; stem long; basin wide, rather shallow, slightly wrinkled; calyx half open; flesh white, moderately juicy, mild, pleasant subacid, good. Winter.

Tubbs Ironclad—Tree from F. K. Phœnix; specimens from E. H. S. Dartt, Owatonna, Minn.—Fruit medium, oblate, very regular; surface yellow, mostly covered with dull red blush; dots gray, distinct; cavity wide, obtuse, regular; stem very short; basin regular, broad, very shallow; calyx open; flesh yellow, mild subacid, good. October.

Tyler Seedlings—These number twenty-five trees raised from seed in 1880 by J. G. Tyler, Hartford twp., Minnehaha County, South Dakota. The best of these will be described at the first opportunity. No. 15 is said to be a yellow winter apple of excellent quality. Introduced by D. F. Harrington, Sioux Falls, South Dakota.

University (*Duchess No.* 103)—Originated about 1882 from seed of Duchess by C. G. Patten, Charles City, Iowa—Fruit large, oblate, very regular; surface a clear yellow with orange yellow on sunny side; dots minute, white,

some distinct russet dots with white bases; cavity wide, deep, obtuse, regular; stem short to medium; basin very wide and shallow, with irregular prominences around the eye; calyx open, segments flat convergent. Core partially open, clasping; cells round, widely slit; tube funnel-shaped; stamens marginal; seeds not many, plump; flesh yellow with some yellow veinings, pleasant subacid, very good. Late fall.

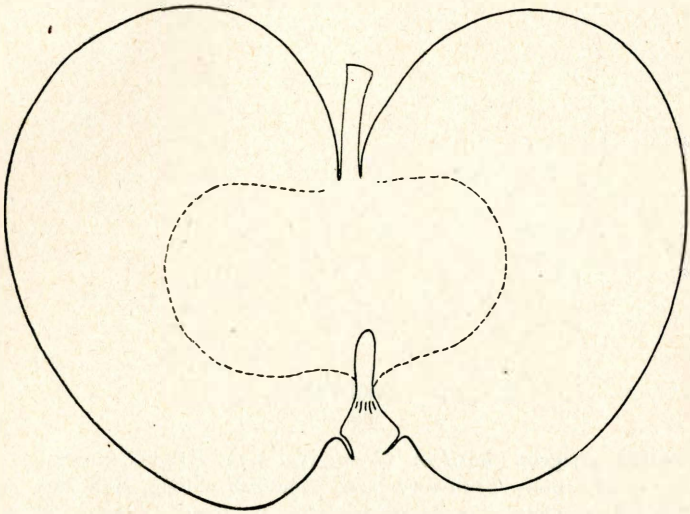


University.
(*Duchess No.* 103)

Utter (*Utter's Red*)—Origin, Wisconsin; much grown in Wisconsin and other parts of the West; the fruit is remarkable for the decided variation shown in specimens from different parts of the tree. Some exhibitors at fruit displays sometimes take advantage of this fact to increase their number of "varieties."—Fruit above medium to large, the typical form is roundish oblate (sometimes roundish, somewhat elongated, angular and flattened at end); surface yellow, splashed, mottled, striped and much dotted with bright red (from interior of tree sometimes only a clear waxen pale yellow); dots white, minute, many, a few small russet dots; cavity regular, deep, usually with trace of russet; stem medium; basin rather shallow, wavy or ribbed; calyx closed, segments very small, divergent. Core open or closed, clasping; cells obovate, slit; tube funnnel-shaped; stamens median; seeds not many, very large and plump; flesh white, fine grained, tender, juicy, mild, pleasant subacid, good. November to December.

Vargul (No. 277)—Origin, Russia; closely resembles Antonovka and perhaps identical with it. Specimens from J. B. Mitchell, Cresco, Iowa—Fruit large, roundish, truncated, obscurely angular; surface uneven, yellow, trace of faint blush; dots very minute, obscure, white, suffused; cavity deep, acute, with large patch of russet radiating out over base; stem short; basin

narrow, rather shallow, abrupt, wrinkled; calyx closed, segments long, large, erect convergent. Core closed, barely clasping; cells ovate, slit; tube conical; stamens basal; seeds rather few, short, plump; flesh whitish, juicy, sprightly subacid, good.



Utter.
(*Utter's Red*)

Vargulek (12 M)—Origin, Russia—Fruit medium, roundish conical, regular; surface smooth, greenish yellow, with dull red splashes and stripes on sunny side; dots white, distinct; cavity shallow, wide, often russeted; stem rather long; basin narrow, wrinkled; calyx closed. Core closed, barely clasping; tube conical; stamens median; flesh white, with yellow veinings, juicy, firm, fine grained, mild subacid, fair to good. September.

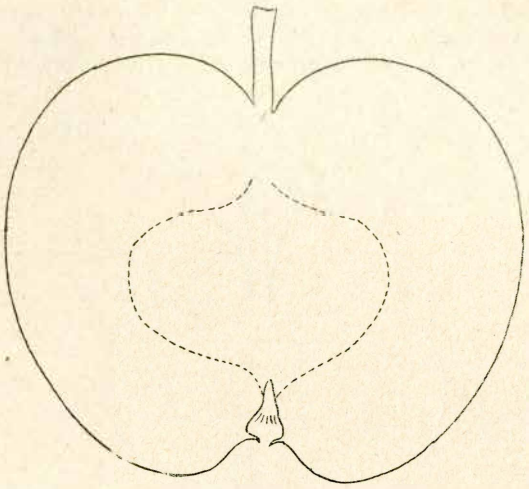
"VARGULEK.

DESCRIPTION: *Vargulek* (12 M)—Size, 5 to 8; form, round, conical; color, straw yellow with splashes of red on sun side; cavity, regular, medium deep; stem, medium long; basin, medium deep, wrinkled, abrupt; calyx, closed; core, small, closed; flesh, fine, white, tough, corky; flavor, pleasant acid; season, September 1st; origin, Russia; tree very upright, moderately vigorous, inclined to blight.

C. Wedge: Clemens and Kinne, of Storm Lake, Iowa, think well of this variety, season, September; the tree is very upright.

J. S. Harris: I do not think it of any value as the tree is inclined to blight.

C. G. Patten: Vargulek is a good tree, but the fruit drops badly."
(*Rus. Nom. Com.*)



Vargulek.
(12 M)

Vasilis Largest (*Basil the Great, No.* 971)—Origin, Russia; a large showy market apple—Fruit very large, roundish oblong, truncated, sometimes roundish oblate, often unequal; surface unctuous, yellow, mostly covered with dark mixed red and crimson stripes and splashes, a very showy fruit; dots large, white, numerous; calyx deep, acute, regular; stem very short; basin wide, rather deep, abrupt; calyx closed or half open. Core irregular, closed; cells slit by irregular fissures; tube very long, conical; stamens marginal; seeds very plump; flesh coarse grained, stained red next the skin and tinged faint red; juicy, acid; fair. Use culinary. September.

Vineuse Rouge—Origin, Russia; as fruited in the Iowa Experiment Station orchard, this variety and Red Transparent, Count Orloff, Grand Sultan, Green Transparent and Aromatic Spike No. 354 are identical or very similar. Tree a strong grower, round topped, a heavy annual bearer—Fruit medium to large, round oblate conic, regular; surface greenish yellow, rarely faintly splashed red on sunny side, overlaid with white bloom; dots large, white, few; cavity narrow, abrupt, with irregular patch of russet; stem short, stout, often clubbed; basin small, shallow; calyx small, closed. Core closed or nearly so, clasping; tube long, funnel-shaped; flesh white, firm, juicy, fragrant, subacid, good for table, very good for cooking. Season very early, about one week before Yellow Transparent, but perishable and should be picked early to prevent water-coring and rotting on the tree. Evidently the name is a misnomer as it means Red Wine Colored.

Vochins Crimean (No. 228)—Origin, Russia; of Romna type—Fruit large, very regular, conical; surface green, overlaid with whitish; dots whitish

green, large; cavity regular, obtuse; stem long, stout, often fleshy and clubbed; basin narrow, very shallow, slightly corrugated; calyx closed. Core closed; cells elliptical, slit; tube funnel-shaped; stamens median; seeds about eight, plump, rounded, short; flesh white, jnicy, sprightly acid, good. Winter.

As grown by J. B. Mitchell, Cresco, Iowa, another very distinct unknown Russian is grown that is worthy of notice:—Fruit below medium; very regular, oblong, somewhat conical, ends flattened; surface almost wholly covered with bright mixed red stripes and broad splashes; a showy fruit; dots minute, few, obscure, whitish; cavity regular, obtuse, some russet; stem very short; basin smooth, shallow; calyx closed, segments connivent. Core closed; cells ovate, entire; tube funnel-shaped; stamens median; seeds about eight, small; flesh white, snow white, very juicy (Fameuse type of flesh), sprightly subacid, very good. Late August, September.

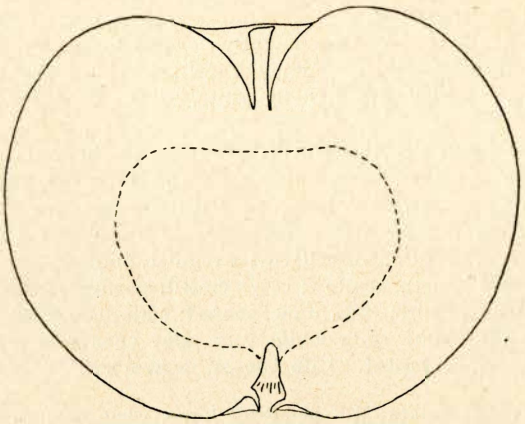
Volga Cross—Origin, Russia—Fruit large, very regular, oblate truncated; surface clear waxen yellow; dots distinct, numerous, minute, russet, a few large russet dots; cavity regular, wide, deep, large stellate russet patch; stem medium; basin wide, slightly ribbed, nearly smooth; calyx open. Core sessile; cells ovate, entire; tube funnel-shaped; stamens median; seeds many, small, plump, short; flesh yellowish white, firm, moderately juicy, pleasant subacid, good. Winter.

Vorgunox—Origin, Russia—Fruit medium to large, round, truncated, regular, or faintly ribbed; surface greenish yellow, faintly striped red; dots obscure, minute, numerous, white; cavity wide, shallow, regular; stem very stout, short; basin broad, shallow, regular; calyx closed. Core closed, clasping; tube conical; stamens marginal; seeds very few; flesh whitish, with green veinings, subacid, juicy, good. September or later.

Voronesh Cross (*Vor. Cross*)—Origin, Russia—Fruit large, oblate, irregular and deeply ribbed; surface greenish yellow, shaded with bright red, obscurely splashed and striped; dots obscure, very minute, white, with green bases on shaded side; cavity ribbed, deep, with considerable stellate russet; stem short; basin shallow, with large and small, irregular ribs and wrinkles; calyx closed; segments erect convergent. Core slightly open, clasping; cells ovate, slit; tube funnel-shaped; stamens median; seed large, many, flattened, pointed; flesh white, juicy, subacid, good. October and later.

Vulcan—Specimens under this name received from Minnesota appear to be Late Strawberry (*Autumn Strawberry*).

Wabasha—Origin, Minnesota—Fruit medium, oblate, regular; surface yellow with faint blush; dots few, very large, russet; cavity deep, regular, somewhat russeted; stem short; basin narrow, rather shallow, regular; calyx small, closed. Core closed; flesh white, juicy, sprightly subacid, good; use chiefly culinary. Early winter.



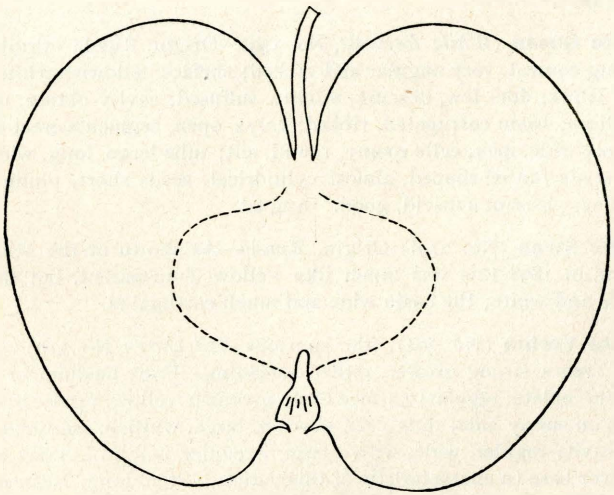
Walbridge.
(*Edgar Redstreak*)

Walbridge (*Edgar Redstreak*)—Originated by Joseph Curtis, Paris, Edgar Co., Illinois, and named Edgar Redstreak, but the shorter name, under which it was raised for many years before the true name became known, has the preference. Tree vigorous, at first upright, but spreading with age, a fine tree in nursery. In many parts of the west it has been a very tardy and shy bearer—Fruit medium, oblate, conical, regular; surface smooth, polished, pale greenish yellow, thinly shaded with pale red, with narrow stripes and splashes of bright red on sunny side; dots whitish, very obscure, few; cavity acute, regular, trace of russet; stem short to medium; basin narrow, flat or nearly so (this is a marked characteristic), minutely wrinkled; calyx closed; small. Core open, clasping; tube funnel-shaped; stamens marginal; flesh white with green veinings, crisp, tender, juicy, mild subacid, fair. All winter.

Waxen—Origin, Minnesota. This name is already occupied by an old Virginia variety and hence should be changed—Fruit above medium to large, roundish, truncated, unequal, irregular; surface smooth, polished, clear waxen yellow, with red blush; dots white, minute, suffused; cavity regular; stem short; basin wavy, corrugated, narrow, abrupt; calyx half open. Core half open, clasping; tube funnel-shaped, long; stamens marginal; flesh yellowish, firm, fine grained, juicy, slightly astringent, subacid, good. Late fall.

Wealthy—Originated about 1861, from seed obtained from Bangor, Maine, by the late Peter M. Gideon, Excelsior, Minnesota. This one variety is an enduring monument for its originator, who persevered in raising many thousands of apple and crab seedlings under the most discouraging circumstances. Tree vigorous, spreading, very productive. There are now many seedlings of Wealthy (see *Peter*)—Fruit above medium to large, roundish oblate, very regular; surface smooth, light yellow, almost wholly covered

with bright crimson splashes and stripes, marbled, mottled and mixed on sunny side, a beautiful fruit; dots many, distinct, minute, white; cavity deep, acute, regular, with slight stellate russet; stem medium; basin deep, smooth, regular, abrupt, sometimes finely wrinkled; calyx partially closed, segments erect convergent. Core small, barely clasping, closed; cells round, entire; tube funnel-shaped; stamens median or basal; seeds plump; flesh white, often stained with red, tender, very juicy, sprightly subacid, very good. October to February. Mr. Gideon planted some Cherry crab seed and thought Wealthy was one of the seedlings. This is not generally accepted as it appears incredible that so great a change could be effected in one generation, even by hybridizing. The tree shows no crab parentage. Wyman Elliott of Minneapolis, Minnesota, one of the leading pioneer Minnesota horticulturists, writes in reply to a question: "I think 1861 is the correct date the apple seed was received from Albert Emerson, Bangor, Maine. I have tried to trace the exact date two or three times and have always come to this conclusion; and with all the present light on seedlings I am uncertain whether it is from *Pyrus baccata* or *P. Malus*. I rather favor the idea it is from some cross of Fameuse or a type of that variety. It seems hardly possible so good an apple should come from purely crab stock in the first generation. One thing we do know: Wealthy seedlings from seed of fruit grown on trees isolated, like the Lyman seedlings, come pretty pure Pyrus Malus in type. In a large majority of experiments, where seedlings of Wealthy have been produced, the mother tree was surrounded by a great variety of crabs and hybrids, so the seedlings must show a very large percentage of crab mixture."



Wealthy.

White Astrachan—Origin, Russia—Fruit medium, roundish, sometimes roundish oblate, irregular; surface clear waxen yellow; dots white,

minute, suffused, some green dots; cavity regular; stem short to long; basin wide, shallow, corrugated and wrinkled; calyx closed. Core closed, meeting; cells ovate; tube funnel-shaped; stamens marginal; flesh white, juicy, somewhat transparent, acid, good for culinary use. August, September.

White Crimean (No. 439; *White Krim*)—Origin, Russia—Fruit medium, oblate, regular, sometimes unequal; surface pale yellow, becoming nearly white; dots very obscure, white, suffused, many; cavity wide, regular, obtuse, much stellate russet; stem medium; basin shallow, ribbed; calyx closed, segments long, pointed, divergent. Core wide open; cells ovate, entire; tube funnel-shaped; stamens median; seeds about nine, plump; flesh white, juicy, acid; quality fair, use mainly culinary. Early August.

White Naliv (No. 157)—Origin, Russia—Of Yellow Transparent type. See *Juicy White.*

White Pigeon—There is a spurious White Pigeon (No. 317) which appears identical with Anis. As recognized in Minnesota the White Pigeon is a very handsomely colored apple, with a long stem—Fruit below medium, roundish, unequal, angular, ribbed; surface light yellow, striped and splashed with bright crimson, the coloring is characteristic in that the stripes are distinct and sharply defined, slightly marbled on sunny side, a handsome fruit; cavity acute; stem very long; basin abrupt, wavy, corrugated; calyx closed. Core open, meeting; tube small, narrow, conical; stamens marginal; seeds about fourteen, short, plump, dark brown; flesh white, stained with red (a marked characteristic), juicy, mild subacid, with sweet aftertaste, good. Fall. Origin, Russia.

White Queen (*White Reinette*, No. 339)—Origin, Russia—Fruit medium, oblong conical, very angular and ribbed; surface yellowish white, overlaid with white; dots few, obscure, minute, suffused; cavity obtuse, regular; stem medium; basin corrugated, ribbed; calyx open, segments erect convergent. Core wide open; cells roomy, round, slit; tube large, long, wide open to core; seeds funnel-shaped, almost cylindrical; seeds short, plump; flesh white, juicy, pleasant subacid, good. August.

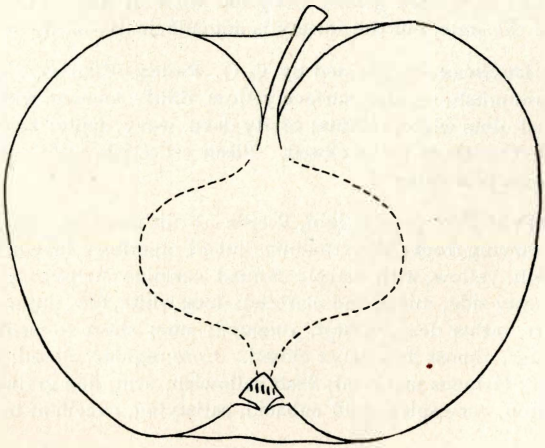
White Swan (No. 219)—Origin, Russia—As shown at the Minnesota State Fair in 1898 this was much like Yellow Transparent, but the dots were large and white; the basin wide and much corrugated.

White Vochin (No 364), (the spurious *Red Queen* No. 316)—Origin, Russia. Tree a strong grower, rather spreading—Fruit medium or above, round, very oblate, regular; surface clear greenish yellow, rarely bronze or red blush on sunny side; dots very obscure, large, whitish, scattered, many areolar; cavity regular, wide, with a large irregular patch of russet extending out over base (a characteristic of this variety); stem long; basin regular, wide, shallow; calyx closed, segments small. Core regular, closed, clasping; tube long, conical; stamens marginal; seeds rather short, plump, light brown; flesh juicy, fine grained, firm, rich, satisfying, mild subacid, good.

A favorite eating apple in the old orchard of Iowa Experiment Station, the last half of July.

Wilcox—Originated about thirty-five years ago on the farm of Elisha Wilcox, Floyd county, northern Iowa—Fruit large, oblate conical, regular; surface yellowish green, mostly overlaid with solid greenish white; dots distinct, few, russet, some minute areolar dots at base; cavity regular, acute, with stellate russet patch; stem short; basin very narrow, very shallow; calyx closed. Cells round, slit; tube conical; seeds plump, short; flesh white, juicy, sprightly subacid, good; chiefly culinary. Early winter.

William Johnson—Originated by William Johnson, Farmington, Minnesota—Fruit medium to large, heavy, oblong conical; surface green, mostly covered with dull red splashes and stripes, overlaid with blue bloom; dots distinct, numerous, white, with large whitish bases; cavity wide, shallow, funnel-shaped, with stellate russet; stem very long and very stout, entirely filling lower part of cavity; basin narrow, flat, with minute wrinkles, segments connivent. Core wide open; cells abaxile, elliptical, slit; tube funnel-shaped; stamens marginal; seeds not many; flesh white, subacid, good Winter.



Windsor Chief.

Windsor Chief—Origin, Wisconsin. Tree very productive and an early bearer. One of the hardiest of the Wisconsin winter seedlings. Fruit hangs well to the tree in high winds—Fruit medium, oblate, slightly conical and angular; surface somewhat unctuous, smooth, light greenish yellow, mostly covered with mixed and marbled dull red, indistinctly splashed, rarely striped with crimson; dots many, large, gray, coalescent, some surrounded with russet; cavity wide, obtuse, regular, russeted, sometimes rather shallow; stem medium to long, slender; basin abrupt, rather narrow,

smooth; calyx closed, segments small, connivent. Core small, closed, clasping; tube funnel-shaped; stamens median; seeds small, elongated, light brown; flesh whitish yellow, firm, fine grained, somewhat spicy, pleasant subacid, very good. December to spring.

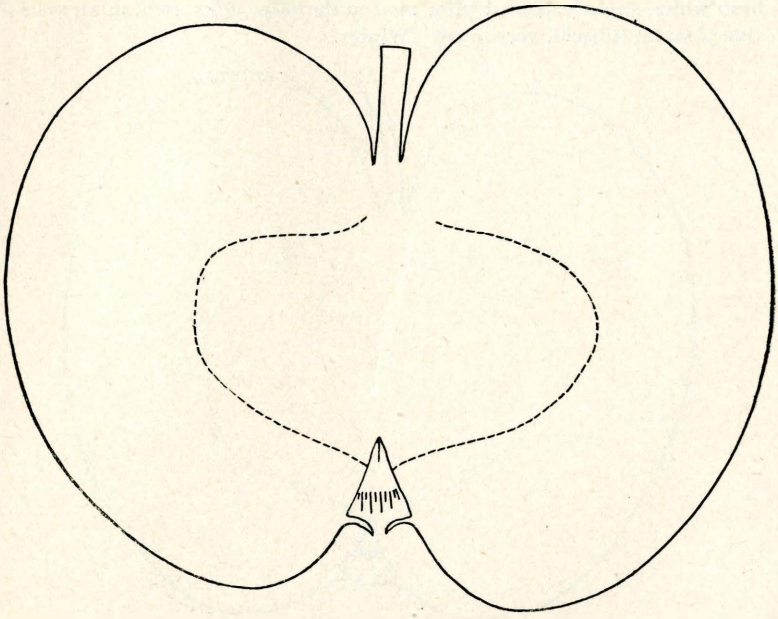
Winesap—Supposed origin, New Jersey; described by Coxe, in 1817, as one of the best cider and eating apples of his region (western New Jersey); very popular in parts of the south and west. One of the leading apples for export. Tree moderately vigorous, with rather open, straggling head; very productive and an early bearer—Fruit medium, roundish conical, often obscurely angular and slightly ribbed; skin moderately thick, very tough; surface smooth, rich dark yellow, mostly covered with fine lively dark red, sometimes obscurely striped, often with russet net-veining, especially toward the base; dots few, minute, indented toward the apex; disinctly elongated toward the base; cavity wide, regular, acute, lined with reddish stellate russet, sometimes extending out a little over base; stem medium; basin narrow, shallow, plaited; calyx closed, segments flat convergent. Core slightly open, clasping, turbinate; cells ovate, slit; tube funnel-shaped; stamens marginal; seeds few, medium, short, plump, rather short, brown; flesh yellow, firm, crisp, fine grained, rich; sprightly subacid, very good. December to May. Fine specimens have been grown along the Missouri river in the southeastern corner of the state, but the variety is not sufficiently hardy at the north.

Winter Duchess—Originated by C. G. Patten, Charles City, Iowa—Fruit large, roundish; regular; surface yellow, thinly covered with splashed and mixed red; dots white, minute; cavity deep, wavy, acute; basin regular, slightly leather cracked; calyx closed. Flesh yellowish, mild subacid, very good. October, November.

Winter Pear (No. 70)—Origin, Russia—Fruit medium, regular, roundish conical, varying from oblate to conic, but all tapering somewhat abruptly; surface smooth, yellow, with sharply defined carmine stripes, splashes and streaks on sunny side, mixed and marbled; dots, white, few, minute, obscure; cavity regular, rather deep, abrupt, russeted; stem short to medium; basin narrow, regular, almost flat; calyx closed. Core regular, closed; tube long, funnel-shaped; stamens marginal; flesh yellowish, firm, fine grained, moderately juicy, rich, very spicy mild subacid, satisfying, excellent to best. All of August.

Wolf River—Originated with W. A. Springer, near Wolf river, Freemont, Wis., and disposed of before fruiting to the late Henry Riflen; supposed to be a seedling of the Alexander which it sometimes resembles, but is more round and less conical and averages larger, as grown in the west. The Wolf River has largely superseded Alexander in the western states. Tree a strong spreading grower, not an early bearer, but productive in alternate years—Fruit very large, often enormous, roundish to roundish oblate, somewhat irregular and angular, especially when overgrown; surface whitish yellow, almost wholly covered with bright red and rosy crimson, with carmine

splashes and thin whitish bloom, a very handsome fruit; dots white, obscure; cavity regular, deep, somewhat acuminate, medium width, russeted; stem short; basin narrow, abrupt, wavy; calyx half open. Core open, clasping, medium size; cells roundish ovate, slit; tube conical; stamens median; seeds not many, short, plump; flesh whitish, coarse grained, moderately juicy, pleasant subacid, good only. October to midwinter.

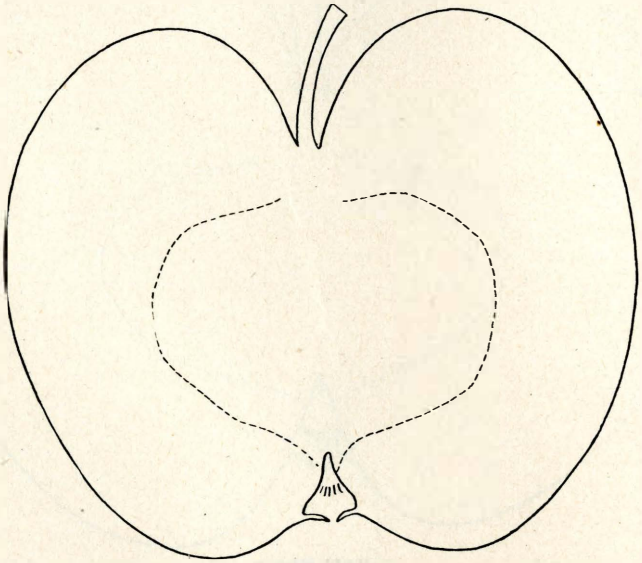


Wolf River.

Wrights Seedling—Origin, Minnesota—Fruit medium, oblong conic, sharply tapering; surface yellow; dots white, suffused, minute, numerous, obscure; cavity regular, russeted; stem short; basin very narrow, flat, wrinkled; calyx closed. Core open; tube funnel-shaped; stamens marginal; flesh white, firm, subacid, with some crabby astringency; use culinary. Fall. Exhibited by J. S. Harris in 1898 at Minnesota State Fair. One of the original Shaw planting about 1852 at Minnesota City, Minnesota. Original tree now dead.

Yahnke—Originated as a root-sprout from a tree killed in 1873, in the orchard of Frank Yahnke, Winona, Minnesota. At first called the Winter King. The original tree is large, spreading and productive. One of the candidates for the seedling winter apple prize offered by the Minnesota State Horticultural Society. Fruit "has kept in an ordinary cellar through March."—Fruit above medium to large, roundish, slightly conical, obscurely angular; surface smooth, clear rich yellow, mostly covered with fine dark crimson, with broad splashes and streaks of carmine, mixed, marbled, nearly

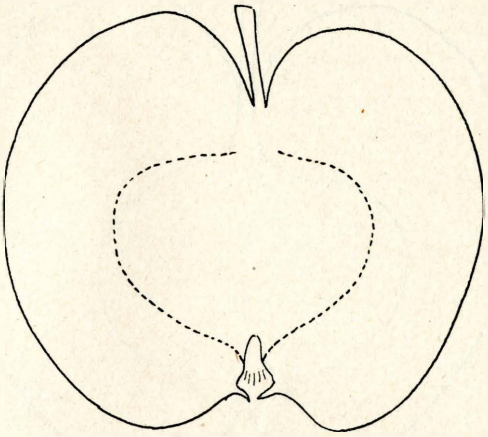
solid on sunny side, a handsome fruit, the broad irregular dark crimson or carmine streaks are characteristic; dots numerous, very distinct, minute, yellow; cavity regular, acute, with a little stellate russet; stem medium; basin smooth, sometimes obscurely ribbed, very shallow, wide; calyx open, segments divergent. Core open, barely clasping; cells ovate, slit; tube conical; stamens median; seeds not many, long, plump, pointed, some imperfect; flesh white, slightly stained pink next to the skin, juicy, rich, mild, saccharine pleasant subacid, very good. Winter.



Yahnke.

Yellow Ingestrie – Originated in England about 1800 by Thomas Andrew Knight, from seed of the Orange Pippin, pollinated with Golden Pippin—Fruit small, very regular, oblate, cylindrical, flattened at both ends; surface unctuous, a clear waxen yellow with warm, deeper yellow cheek; dots very obscure, numerous, minute, white; cavity regular, obtuse, with considerable light stellate russet; stem long; basin smooth, wide, abrupt, regular; calyx closed; segments erect convergent. Core open, clasping; cells ovate or obovate, entire, axile; tube funnel-shaped; stamens median; seeds few, flattened, large, pointed; flesh yellow, fine grained, firm, crisp, juicy, excellent. August, September. Ripens in succession. An old variety still shown at the Iowa State Fair from the central district. Too small for an apple and too large for a crab.

Yellow Kiev (47 M)—Origin, Russia—Fruit small; form roundish truncated; surface yellow, with transparent skin; dots large, yellowish, suffused, numerous; cavity small, acute; stem medium; basin rather shallow, corrugated; calyx closed. Flesh white, juicy, firm, subacid, good. August.



Yellow Sweet.

Yellow Sweet—Origin, Russia—Fruit medium, roundish, oblate, regular; surface yellow, skin transparent type; dots white, suffused; cavity regular, acute; stem short to long; basin narrow, shallow, wrinkled, abrupt; calyx closed. Core closed; cells ovate, entire; tube conical; stamens median; seeds few, short, plump, flattened, some imperfect; flesh white, sweet, good. August.

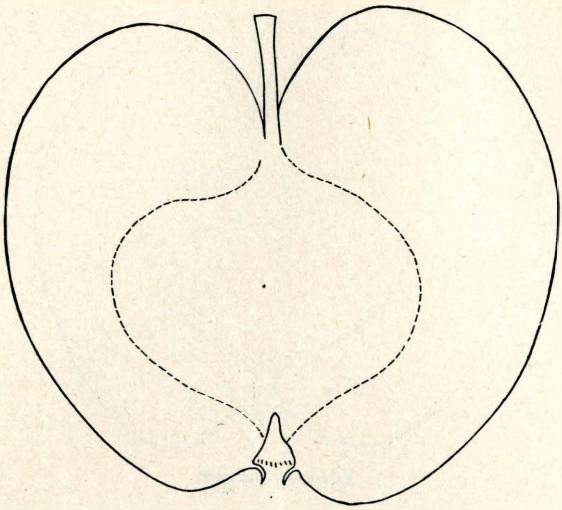
"YELLOW SWEET GROUP.

Yellow Sweet; No. 321; Green Sweet of Patten.

DESCRIPTION: *Yellow Sweet*—Size, 5; form, oblate, roundish; color, greenish yellow with bronze blush on sun side; cavity, narrow, acute; stem short, medium; basin, broad, medium deep, slightly wrinkled; calyx, open; flavor, sweet, good; season, summer; origin, Russia; tree slow, medium upright grower, free from blight, slow in coming into bearing.

C. G. Patten: This is one of the freest from blight and one of the hardiest that we have, and valuable, though a tardy bearer." (*Rus. Nom. Com.*)

Yellow Transparent—Origin, Russia; imported from St. Petersburg, by U. S. Department of Agriculture. Tree upright, round-topped, an early and good annual bearer—Fruit medium, roundish conical, sometimes roundish oblate and slightly conical, obscurely angular; skin smooth, transparent; surface clear white, becoming pale yellow at maturity; dots white, large, suffused, obscure; cavity regular, obtuse, usually russeted; stem medium to long; basin narrow, shallow, corrugated; calyx closed. Core slightly open, clasping; tube funnel-shaped; stamens marginal; flesh white, tender, fine grained, juicy, pleasant, sprightly subacid, very good. Early August.



Yellow Transparent.

"TRANSPARENT GROUP.

Yellow Transparent; No. 60; White Transparent; Red Duck (spurious); Charlottenthaler; Enthaler; Thaler; Erdbeer Streifling; Nitchner's Erdbeer.

DESCRIPTION: *Transparent*—Size, 5 to 6; form, round, conical; color, pale straw-yellow, skin showing slightly raised irregular gray dots; cavity, very broad, medium deep; stem, long, rather stout; basin, medium, wrinkled; calyx, open; core, medium, nearly closed; flesh, fine grained, nearly white; flavor, pleasant acid; season August 1st to 10th; origin, Russia; tree upright; round topped.

A. G Tuttle: I find this variety profitable for the earliest fancy market, shipped in small boxes." (*Rus. Nom. Com.*)

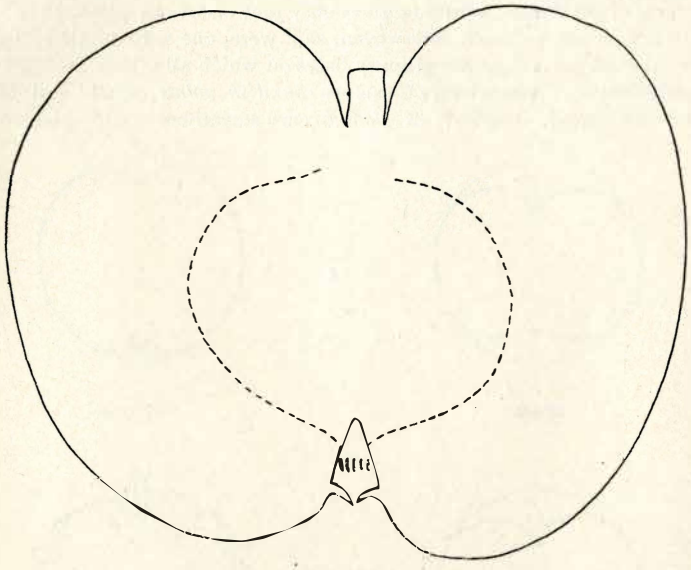
Zolotareff (No. 275)—Origin, Russia—A large handsomely colored apple of the Vasilis Largest type and much resembling that variety.

Zuzoff (No. 585)—Origin, Russia. For a time Anisim was mixed with this variety, but the two are very distinct—Fruit large, heavy, roundish oblate, regular or faintly angular; surface smooth, glossy, greenish yellow, almost or wholly covered with a peculiar dark brownish red, no stripes nor splashes, a showy fruit; dots minute, numerous, whitish, distinct; cavity abrupt, very deep, regular, green and russet, the russet sometimes extending out in irregular rays; stem very short; basin small, regular; calyx closed, segments small, erect convergent. Core regular, clasping; tube conical; stamens median; seeds few, plump; flesh white, with greenish tinge and veinings, juicy, firm, fine grained, subacid, good. Winter.

"ZUZOFF.

DESCRIPTION: *Zuzoff*—Winter Zuzoff of Tuttle—Size, 8 to 9; form, round-oblate, rather angular; color, greenish, nearly or quite overspread with dark red with many white dots; cavity, broad, medium, deep; stem short, stout; basin, narrow, abrupt; calyx, small, closed; core, closed, small; flavor subacid; season winter; tree upright, good grower, tardy bearer."

(*Rus. Nom. Com.*)



Zuzoff.
(No. 585)

Zwiebel Borsdorfer—Of German origin; trees received from Russia. Lacks in size of fruit—Fruit small, depressed oblate, truncated, very regular; surface roughened by the dots, green with dull brownish red cheek with grayish net-veinings, no stripes nor splashes; dots few, large, russet, some areolar; cavity wide, regular, with a large ramifying patch of russet which often covers the entire base; stem very long; basin regular, very wide and shallow, almost flat; calyx closed, segments flat convergent. Core closed, barely clasping. Flesh subacid, good. Late winter.

TERMS USED IN DESCRIBING APPLES.

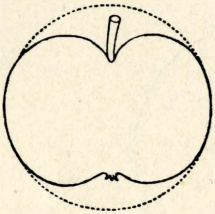
Tree—In closely related varieties it is sometimes essential to know the characteristics of growth in the orchard and the color of the young wood. The color and general appearance of an apple may be changed to a considerable extent by soil and climate, but the general habit of growth and color of

young wood do not change materially. The pomologist, however, must strive to seek distinguishing characters in the fruit itself and not be dependent upon the tree in orchard or nursery save as confirmatory evidence.

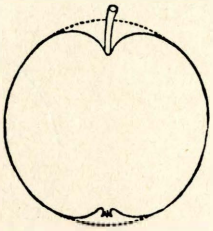
The growth of the healthy bearing tree may be *strong* and *vigorous*; *vigorous* and *slender; stout* and *short-jointed; medium* and *vigorous*. The form of top may be *upright* and *spreading*, *spreading*, *round-headed* or *upright*.

Form—Some European writers have made elaborate systems based on the form of the fruit. Downing gives only four classes as follows:*

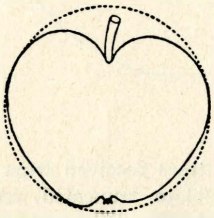
"Forms are so much interwoven, as it were, one with another, that we have selected but four as the primary bases on which all others are built, and are subsidiary. These primary forms are *roundish*, *oblate*, *conical*, and *oblong*. The terms *round*, *roundish*, or *globular*, are sometimes used in connection,



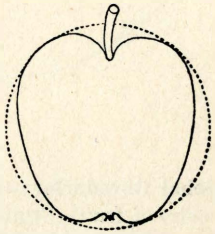
Oblate.



Roundish.



Conical.



Oblong.

rather as qualifying expressions than as distinctive; for while the word *roundish*, which indicates the height and diameter are nearly equal, applies to many fruits, there is no perfectly round or globular apple known." *Oblate* or *flat*, is when the height is much less than the diameter. *Conical*, is when the fruit is roundish and tapers toward the apex or basin. *Oblong*, is when the fruit is longer than broad, with the apex and base of nearly the same breadth. Often a fruit unites two primary forms, *oblate conical* meaning a flat tapering apple. *Truncated*, means flattened at one or both ends. *Truncated conic*, means a conical apple flattened at the apex.

* Fruits and Fruit Trees of America. Downing, p. 71. The above four cuts are from Downing.

Axis—This is an imaginary straight line between the stem and the center of the calyx. The axis is *inclined* when the fruit is oblique or lop-sided; *short* when oblate or the cavity and basin are *deep*; *long* when the fruit is oblong. The core cells are *axile* when they meet the axis; *abaxile* when distant from it. When a section is made through the apple at right angles to the axis is circular, it is *regular;* if very true so it could be turned in a lathe, it is very *regular;* it may be *irregular*, *compressed* or flattened sidewise, *angular*, *furrowed* or *ribbed*, rarely *triangular*, *quadrangular* or *pentangular*.

Size—The size is variable, depending upon soil, climate, overbearing, age and health of tree, etc. The one given is that attained as an average and under normal conditions. The size may be very large, large, medium, small, very small.

Surface—The skin may be thick or thin, smooth or uneven, lumpy or pimpled, rough, polished, covered with bloom, unctuous or oily, sometimes russeted in whole or in part. The amount of russet varies, especially about the stem. The color usually consists of two, the ground color of green or yellow, with over color of red. When the ground color is not striped, the fruit is self-colored, although it may be blushed or shaded. The color is a conspicious feature, but is modified by climate, season, soil and whether grown in shade or sunshine. Older trees usually yield better colored fruit. Only well colored, exposed specimens should be selected for determination. *Stripes* are broad alternating lines of color. *Streaks* are long, distinct narrow stripes. *Splashes* are short, abruptly broken stripes of all sizes. When *marbled* the stripes are wide, faint, wavy or irregular. When *washed* or *shaded* the coloring is even or changes gradually as in a water color painting. When *mottled* the dots nearly run together. When in part *dotted*, as in Utter, the red appears as distinct dots. *Blotched* red is of various abrupt shades irregularly placed. When *clouded* the blotches are broader and more softly shaded.

A bright color is sometimes dulled by being overlaid with a whitish or grayish color which is sometimes suffused, or by open russet net-veining. In the latter case it gives a bronzed appearance. In a very few varieties, especially Westfield, the russet about the basin resembles a piece of bent dry leather, and hence is termed *leather-cracking*.

It is impossible to give the exact shade of red in an apple. It may vary from light or pale red to black red. *Crimson* is a clear beautiful dark red, with a slight admixture of blue. *Carmine* is a beautiful darker crimson, bordering on purple. *Pink* is a clear bright light red. *Rose* is a delicate pink. *Orange red* is when the red is mixed with yellow.

Dots—These are more numerous towards the eye. As a whole they may be obscure or distinct, many or few, large or minute, white, whitish gray, green, yellow or russet, round, elongated, stellate (star-shaped). When surrounded with light or green bases, they are called areolar by some writers.

The dots may be depressed, prominent, or even so much raised as to roughen the surface.

Stem—This is sometimes a constant mark, but is often variable. When reaching to the general curvature of the fruit it is *medium;* when below this outline, *short*; when extending out beyond, *long*. It may be stout or slender; straight or curved, rarely fleshy or knobbed. As means of identification the color of the stem is not reliable.

Cavity—This is the depression in which the stem is inserted, and may be wide, deep, shallow, regular, irregular, wavy, uneven or folded. In a few varieties the cavity is nearly or quite filled up and is then termed *flat*. It is *obtuse* when blunt or rounded at bottom; *acute* when ending in a sharp point; *acuminate* or *funnel-shaped*, when terminating in a long drawn out taper, which usually crowds closely the lower part of the stem; the stem is then sometimes termed *deeply inserted*. When *lipped*, part of the flesh crowds up against the stem, as in Roman Stem. The color may be green or russeted. When the russet extends out in ray-like lines, it is termed *stellate* or *radiating russet*.

Basin—This is the depression at the apex, crown, or "blossom end." It should be carefully distinguished from the *base*, which means the stem-end, carrying out the thought that the foundation or source of the fruit is at the stem. Descriptions generally should read from the stem outward, from base to apex. The basin may be flat, very shallow, shallow, medium or deep, narrow or wide; *abrupt* when the slope is steep; *smooth*, *regular* or *even* when not furrowed, and so regular and symmetrical that the form could be turned in a lathe; *cup-shaped* when the slope is nearly perpendicular; *angular*, with several corners; *wavy*, with gentle and irregular undulations; *furrowed*, with more regular undulations; *wrinkled*, with small irregular undulations; *corrugated*, with larger, irregular ridges; *plaited*, with small, straight, regular ridges; *ribbed*, with larger obtuse or rounded ridges; the bottom may have small isolated prominences in bottom. The rim of the basin may be sharp or rounded broadly, or may be smooth or ribbed.

Core—When an apple is cut in halves crosswise the core is seen in the center, consisting normally of five cells of tough parchment-like texture containing the seeds and surrounded by flesh. Outside of this is the core-outline or boundary consisting of ten fibro-vascular bundles which, carrying the nutriment, emerge from the stem and branch out over the fruit, meeting again at the calyx-tube. According to Warder, if these unite on the inner end of the tube the core is *meeting*; if lower, nearer the eye, it is *clasping*. It is a useful point with many varieties. Outside of the core-outline is the larger part of the flesh, different somewhat in texture and color from that inside, next the cells. The fibro-vascular bundles are either opposite the points of the cells, or alternate with them, usually the larger being opposite the points. The outline of the core is clearly seen only when cut, the fruit is cut in halves lengthwise and through or near one of the fibro-vascular

bundles. Counting from the stem, the core outline may assume various forms, such as cordate, turbinate, oval, roundish, wide or compressed, or spindle-shaped, long or short, regular or irregular; large when the breadth is considerably over half the diameter of the fruit; small when much less. The core is usually *central* or in the middle of the fruit, but may be *sessile* or close to the stem, or *distant* when nearer the calyx. The core may be very small and compact with seeds crowded in cells, in others the cells are large and roomy so that the seeds loosen and rattle when the apple is shaken. The other characteristics of the core are given in Hogg's classification.

Seeds—These may be numerous or few, large or small, from light or gray brown to dark brown or black, short or plump, long, plump or flattened, blunt or pointed, often some are imperfect. The latter is often a constant characteristic. Sometimes the exact number of seeds is given, but this must be understood as being approximate only, the number varying. In a few varieties, such as Saxton, the seeds loosen very readily when ripe and rattle when the apple is shaken.

Flesh—The color ranges from white to yellow, sometimes with greenish tinge, or stained with red. The flesh may be juicy or dry, firm and compact or loose, spongy or marrowy; tender, delicate, crisp, fine or coarse grained. The flavor may be sweet, mild subacid, sprightly or brisk subacid, or sour, acid, very acid, astringent, insipid or rich, highly flavored and spicy. As to odor, the fruits sometimes may be perfumed or aromatic. The quality is expressed by the terms poor, inferior, good, very good, excellent, best. This judgment depends somewhat upon the individual—"there is no accounting for tastes."

Use—Many varieties of only moderate quality for dessert use are cultivated because of greater productiveness; their bright color may take well in the market, or the fruit be excellent for culinary use. Some of those ranked as best in quality are not much grown because of shy bearing or weakness of tree.

Season—The season during which the fruit is best varies with the locality, the season being earlier southwards, and later at the north. The season may be early summer, summer, early or late fall, early winter, midwinter, late winter, or spring.

AN ENGLISH ARTIFICIAL CLASSIFICATION.

In 1876 Robert Hogg, the leading pomologist of England, published an artificial system in which new points are considered. The structural characters on which Hogg bases his classification are: 1. The Stamens. 2. The Tube. 3. The Carpels. 4. The Sepals.

These are all seen when an apple is cut in halves lengthwise from the stem to the calyx. Beginning at the calyx and going inward we find first the calyx segments, which by Hogg and other authors are called the eye,

and immediately inside of these segments is a cavity called the flower-tube or calyx-tube. (By some the word *eye* is used to denote both the calyx-tube and the segments.) Inserted in this tube is a ring of small bristle-like organs, which are the dried-up remains of the stamens, and these occupy three different positions in the tube.

The tube itself is either conical or funnel-shaped. Further inside, just beyond the tube, is the core, the cells of which assume four different forms. Each of these varies in its relation to the axis of the fruit, some extending close to it and forming symmetrical cells, while others are distant from it and are unsymmetrical.

1. The Stamens—Hogg adopts the varying position of the stamens in the tube as the primary divisions of his system, having found by experience that they are, on the whole, the most reliable characters where all are more or less changeable. The stamens are (1) *marginal*, when near the inner end of the tube; (2) *median*, when near the middle; (3) *marginal*, when near the outer end. A sharp knife and careful cutting are necessary to determine this accurately. Some varieties have too short a calyx-tube to make three divisions safe, but in general it is a very useful point. Lucas* objects to making the position of the stamens the main character in the classification, because it would necessitate cutting the specimen at once, which is not always desirable nor practicable. However, he admits that the characteristic is in fact a good and constant one, in spite of occasional exceptions and variable varieties.

A brief study of the cuts in this Bulletin will make the reader familiar with the varying positions of the stamens. In Plumb Cider the stamens are always *marginal*; in Grimes Golden, *basal*; in Oldenburg (see frontispiece), *median*.

2. The Tube—The difference between a conical and a funnel-shaped calyx-tube is best learned by an inspection of the cuts in this Bulletin. The frontispiece (Oldenburg) shows a funnel-shaped tube; Grimes Golden has a conical tube.

3. The Carpels—These make up what is popularly called the *core*. They are generally five, occasionally they are four or even three, but this is very rare. If split down the middle, its walls or tough membranous lining will be either *round*, *ovate*, *obovate* or *elliptical*. To prevent error in distinguishing between ovate and obovate, the observer should hold the apple with the calyx toward him, and the stem pointing outwards. An *ovate* cell would then taper toward the calyx; an *obovate* cell presents the largest part nearest the observer, and tapers toward the stem. In relation to the axis of the apple, they are either *axile* or *abaxile*. When the walls extend to the axis, and these characters will be best seen by making a transverse section of the fruit, the cells are symmetrical, and then said to be *axile*, whether the core is open or closed. When they are distant from the axis, and the

* Dr. Ed. Lucas. Einleitung in das Studium der Pomologie. Stuttgart, 1877, p. 142.

cells are unsymmetrical, they are called *abaxile*. Further, the walls may be *entire* or *slit* by transverse fissures.

4. The Sepals or Eye—The sepals or segments of the original calyx of the flower were uniformly expanded and spreading. After the petals of the flower drop, and the fruit develops, the segments persist* and gradually assume various directions, and when it is perfectly matured we find them in four distinct forms: (1) *Divergent*, when the segments are quite recurved or reflexed, frequently so much as to fall back flat on the fruit in the form of a star; (2) *erect convergent*, when the segments are never reflexed, but are erect with their margins merely touching and their points divergent; (3) *flat convergent*, when the segments are flat, closing the eye, but with their margins merely touching and not overlapping each other; (4) *connivent*, when the segments are all close together, overlapping each other and forming a compact cone. I find the segments are too variable, however, to be depended upon for final judgment in all cases, although they are very useful in many varieties.

HOW TO STUDY APPLES.

First study the technical terms employed, and the leading systems of classification. This knowledge is then illustrated in practice by comparing good, typical, well-matured specimens of a number of standard varieties with their printed descriptions. The reader is now prepared to make descriptions for himself and practice will soon give accuracy and facility. The systematic study of fruits should become an important feature of laboratory work in American agricultural colleges, as it long has been in the horticultural schools of Europe.

The advocates of Nature Study will find rich material for interesting exercises in comparing well known varieties of apples as well as in other exercises in systematic pomology. Fruit growers generally will find it advantageous to study the characteristics of varieties and will make rapid progress in such study if it be made systematic. For this purpose outlines or blanks something like the following will save time and serve as an aid to the memory. If the blanks are printed some of the most common terms may be added under each heading and the appropriate ones indicated by a check mark or a circle around them, or the others crossed out. An impression of the fruit should also be taken. No free hand drawing is necessary or advisable. The apple is cut in halves lengthwise, using a sharp knife, so that the calyx-tube is exposed. This will require a little practice; it is best to approach it gradually by cutting several thin slices until the exact axis is reached, the axis always passing through the calyx-tube. The surplus moisture is now removed with blotting paper or cloth. The edge, core outline, calyx-tube, and end of the stem are now touched with a moistened soft indelible or aniline pencil. The apple is now pressed firmly against the paper.

* In the various varieties of the pure Siberan crab (*Pyrus baccata*) the segments are deciduous, *i. e.*, fall off as the fruit develops

The only drawing necessary will be to complete the stem and indicate the position of the stamens; this is done with a hard pencil. The paper should not be too heavy in texture. Thin writing paper is good for this purpose. A convenient size for the sheets is about nine and one-half inches long, seven and three-quarters wide with two holes punched along left hand side for convenience in binding. Such blank sheets with suitable covers are now used for note-taking in many schools; the advantage being that the sheets can easily be arranged in alphabetical order, and new pages added at any time:

..... (NAME OF VARIETY)

APPLE DESCRIPTION.

(OUTLINE OF VARIETY)

BY .....

DATE .....

CONDITION. .....NUMBER .....

GROWN BY .....

Classification .....

Size—Very large, large, medium, small .....

Form—Oblate, round, conical, oblong .....

Skin—Thin, thick, tough .....

Surface—Smooth, rough, polished, unctuous, (1) pale, (2) colored, (3) striped, (4) russet, ground color....., over color.....

..... bloom.....;

Dots—Obscure, distinct, few, many, color....., size....., areolar.....

Cavity—Width...., depth...., form... , color...., russet ....., stellate.

Stem—Short, medium, long, slender, stout. .....

Basin—Width....., depth....., form.....

Calyx—Open, half open, closed. .....

Segments—Divergent, erect convergent, flat convergent, connivent.....

Core—Open, half open, closed, form....; meeting, clasping; sessile, distant.

Cells—Axile, abaxile, round, ovate, obovate, elliptical.....

Tube—Conical, funnel-shaped. .....

Stamens—Marginal, median, basal. .....

Seeds—Color....., size, shape, number perfect..., number imperfect...

Flesh—Color, texture. .....

Flavor—Acid, subacid, sweet. .....

Quality—Poor, fair, good, very good, excellent, best. .....

Season—Summer, fall, winter, spring. .....

Remarks—Tree, history, etc.....

ACKNOWLEDGMENT.

The neatness of the drawings in this Bulletin is due to Miss Charlotte M. King, artist of the Iowa Experiment Station, who made the drawings for the engraver from the outline impressions taken direct from the apples by the writer.

ERRATA.

Page 28, 3d line from top, for *Russia*, read "*Transylvania, trees received from Russia.*"

Page 29, 3d line from bottom for *decidedly less inferior*, read *decidedly inferior.*

Page 32, 9th line from top, insert *subacid* after *juicy.*

Page 41, 8th line from top, insert *subacid* after *juicy.*

Page 43, 15th line from top, for *marginal* read *median.*

Page 57, 15th line from top, for *Repka* read *Pipka* No. 202.

Page 75, 2d line from bottom, insert *Pear* after *Moscow.*

Page 78, 10th and 11th line from top, for *Ohligee* read *Oligher.*

Page 79, 4th line from bottom, for *basal* read *median.*

Page 79, 4th line from bottom, insert *juicy* after *white.*

Page 116, 7th line from bottom, for *sometimes* read *somewhat.*

AFTERMATH.

Since the preceding pages were put in type, several letters regarding the origin of several varieties have been received, which are placed on record herewith. Further notes and corrections will be thankfully received for future use. As far as the writer is able, the names of any variety of apple grown in this state and received for identification, will be determined free of charge.

Brett—Clarence Wedge, of Albert Lea, Minn., writes: The Brett originated from a barrel of apples said to have been Golden Russet and Tolman *Sweet* mixed, grown by Mr. Harroon Smith, of Dover, Minn., seed planted by Mrs. Mary Brett, near Dover, Minn., spring of 1872. Tree very healthy and hardy, and we believe at present in good condition. A good fruit that would have been given more attention if it had not been overshadowed by the Wealthy of similar color, size and season.

Bon Homme County—Originated by Hon. Henry Dykstra, Bon Homme county, S. D., from seed of Baldwin planted in 1874. According to Peter C. DeLinde, of Perkins, S. D., who introduced this variety and has an orchard of it in bearing, the tree is productive and the fruit keeps till June.

Elgin Beauty—"A sister of Rollins Prolific and Rollins Pippin, all of which we regard as of very small value as practical varieties. Season with Wealthy, small to medium, with a peculiar sickish subacid flavor. Tree quite hardy and prolific." CLARENCE WEDGE,
Albert Lea, Minn.

Golden Ball—Also known as Hyde's King of the West. Introduced by Rev. D. M. Hyde near Winona, Ohio, over thirty years ago.

Mallett (No. 980)—As imported by the Department of Agriculture it has the name of White Pelikanoff but is not true to name. Its true name is Mallett. PROF. J. L. BUDD,
(Bulletins Iowa Agr. College.)

Mountain Beet—"The Mountain Beet apple originally was raised from seed at Abbotsford, Quebec, by the grandfather of Mr. J. M. Fisk, of Abbotsford, and planted in an orchard about eighty-five years ago. It received its name later on. For the last twenty-five years it has not been profitable in the eastern townships owing to the scab, to which it is subject quite as much, if not more so, as the Fameuse. This above information I received from Mr. J. M. Fisk." W. T. MACOUN,
Central Exp. Farm, Ottawa, Canada.

Oligher—"The Humes seedling described by J. S. Harris (Minn. Hort. Soc. Report 1902, p. 260) is Oligher No. 16. The Campbell seedlings are

Olighers. Nos. 2, 6 and 8 are in propagation. No. 2 is very hardy and resembles the Duchess very much in leaf and wood, and is one of the best eating apples we raise."

S. D. RICHARDSON,
Winnebago City, Minn.

Tetofsky—Downing wrote it Tetofsky and this is the usual spelling, at least in the West; Warder's version is Tetofski. The U. S. Division of Pomology, writes in reply to a question: "The reason why Bulletin No. 8 spells Tetofski with an 'i' instead of 'y' is because Mr. Lyon who was chairman of the committee on revision of catalogue, took as his standard, Dr. Warder's Pomology. I find on looking up later authors it is frequently spelled with 'y,' but as to who is right in this matter I am unable to say. I cannot find any record to show when this apple was introduced."

THE TRIAL OF NEW VARIETIES.

Sometimes fruit lists are made up from the results of circular requests to many fruit-growers. This usually gives old varieties undue prominence because, although often lacking to a serious extent in some important essential, yet they are the best known to the often limited experience of the correspondents. But, on the other hand, it would be unwise to plant largely of new and untested varieties, because of the even greater liability to failure. If we could know the history and exact pedigree of a variety it would aid materially in forming our judgment, if the law of DeCandolle, mentioned on an earlier page of this Bulletin, holds as true of the apple as of all other cultivated plants. In the absence of such exact knowledge, and knowing the strong probability of mixed hardy and tender ancestry from having been grown in orchards containing many varieties, it is worth while testing any novelty that is promising as to size, color and quality of fruit. The western markets favor large red apples, quality being apparently subsidiary to color and size. Hardiness of tree is of course the most important character of all. All our standard varieties were novelties once, and general trial in many sections was necessary to determine their value. Some varieties are of local adaptation only;

others, such as Oldenburg, are cosmopolitan in range and succeed over a wide area and in many soils.

From the preceding pages it is apparent that the Northwest has no lack of summer and fall apples, but there is still need of more winter apples.

TOP-GRAFTING.

By top-grafting is meant the grafting of a variety into the limbs or top of another variety. When this is done by budding, it is termed top-budding. Top-working means either one. By this method we are enabled to try many varieties in a small orchard, each tree being top-worked with several. Again, many varieties fail from sun-scald of the stem or from weakness in the forks, causing injury from splitting down of the limbs. These troubles are obviated by top-working upon extra hardy varieties which are free from these defects. The Oldenburg apple and Whitney and various Siberian crabs have been used as stock for top-working, but the general experience is rather unfavorable, many sorts overgrowing the stock, causing enlargement at point of union and liability to blow off. Haas is a strong grower, but deficient in hardiness for the north. At the present writing, the varieties most favored as stocks are Virginia crab and Hibernal apple. In the spring of 1896 many trees of both these varieties, also the Anisim apples, were planted on the station grounds, the writer being familiar with the discussion and experimentation in that line then current in Iowa. The winter of 1898-99, however, abruptly checked this line of work with the Hibernal and Anisim apples, because of root-killing of the apple seedling stocks upon which they were root-grafted; and because of the winter-killing of the young scion roots. The Virginia crab trees saved themselves because the scion roots proved hardy. These results

were reported in Bulletin 65. Evidently the work of securing hardy stocks must begin *below the surface*, or else great care be taken to mulch every winter to prevent root-killing. The Russian method of preventing this trouble by using the Siberian crab as a stock was deemed worthy of a trial. This means that the entire root system—everything below the surface of the ground—is Siberian; everything above the surface is of the desired variety. The Virginia crabs are being top-grafted; the Hibernal trees now being grown in the nursery upon Siberian stocks it is hoped will be top-worked in due season with various new and standard winter sorts. At the present writing, it appears desirable to plant an extra number of trees of some very hardy variety, such as Hibernal apple, in orchard, and a year or two afterward, as soon as well established, they can be top-grafted in the main limbs with less hardy sorts. Grafting in the limbs is especially desirable, as it will lessen liability to split down in the forks under heavy loads of fruit. Top-grafting tends to cause earlier bearing (see note under *Malinda*) because the more or less imperfect union between stock and scion checks the downward flow of elaborated sap, thus favoring the formation of fruit-buds rather than of leaf-buds. In effect, it is a mild form of girdling or ringing.

Some fruit growers have thought that by top-working even very tender varieties can be grown at the North. This is an error. Top-working apparently does not increase the inherent hardiness at least to any marked extent, but gives more favorable conditions for growth.

AN ARTIFICIAL KEY OR SYSTEM OF CLASSIFICATION.

The following Key is designed to help the fruit grower to determine the name of a variety unknown to him, and which is described in this Bulletin. In Europe many attempts have been made to construct natural systems of classification of apples, but no one has yet attempted to do this for America. The following is to be considered as a preliminary attempt only, subject to revision and change when the internal characters have been determined and further verified for all the varieties noted. The four main divisions are 1, Russeted; 2, Solid Red; 3, Green, Yellow or White; 4, Striped:

CLASS A. RUSSETED; Surface more or less covered with russet.

Late winter; basin smooth, deep.....Iowa Russet
basin smooth, leather-cracked.....Golden Russet
Early winter; tube conical.....Perry Russet

CLASS B. SOLID RED; the ground color almost or entirely covered with solid red, never striped.

Tube conical, stamens basal
Fruit very large.....Cardinal

Tube conical, stamens median
Core meeting.....Lord
Core outline round.....Long Homer
Size very small; stem long.....Broad Green
Size large, flesh greenish white, green veinings.....Zuzoff
Size above medium, surface mottled and shaded.....Gipsy Girl

Tube conical, stamens marginal
Basin flat, much corrugated and ribbed.....Sumnoi Calville
Basin very shallow, wrinkled; form oblate.....Long Arcade
Basin very small, smooth; size large.....Lyman Sweet

Tube funnel-shaped, stamens median
Color black red—
Cells round.....Black Annette
Cells ovate.....Black Oxford

Color dark red—
Flesh much stained with red.....*Raspberry and Red Sided*
Flesh greenish white, seeds very large flat.....Blackwood
Basin narrow, very shallow or flat.....Anisim
Basin very wide, shallow.....Red Stettiner
Flesh snow white
Basin wide, very shallow or flat, corrugated.....Switzer
Basin smooth, rather shallow.....Louise
Basin shallow, narrow, wrinkled and corrugated. Red Wine
Basin rather shallow, smooth, abrupt.....McIntosh

Tube funnel-shaped, stamens marginal

Flesh sweet ..... Ferris Wheel

Flesh subacid; size medium; early winter ..... McIntosh
Flesh subacid; size small; late winter ..... Ditus Day

CLASS C. GREEN, YELLOW OR WHITE; with or without blush, but never striped.

Early Summer

Flesh sweet

Stamens marginal ..... Smoky Arcade
Stamens median; form roundish conical, pentangular .. Sweet Moscow
Stamens median; form roundish oblate ..... Yellow Sweet

Flesh subacid or acid

Pale yellow to white, *never blushed*

Size below medium to small

Roundish oblate, stem long to very long ..... Moscow
Roundish, truncated ..... Yellow Kiev
Oblong, truncated ..... Red Ananas

Size medium or above

Oblong conical, very angular and ribbed ..... White Queen
Roundish conical; basin narrow, shallow, corrugated ....
..... Yellow Transparent
basin wide, much corrugated ..... White Swan
basin narrow, corrugated, stem long ..... Juicy White
Conical; cavity much russeted ..... Hare Pipka
Roundish oblate, slightly conical; dots white, large ...
..... Yellow Transparent
Roundish oblate; dots greenish; stem medium, stout ..
..... Bielgorod
Roundish, regular; dots greenish; stem long .... Breskovka
Roundish to roundish oblate; dots white and green ....
..... White Astrachan
Round oblate, truncated, very regular ..... Potainoe
Oblate; cavity wide, much russeted ..... White Crimean

Pale yellow to white, *rarely a slight blush*

Round oblate, conic ..... Vineuse Rouge
Round, very regular; size large ..... Bellerdovskoe
Very oblate ..... White Vochin

Pale yellow to white, *with pale blush*

Stamens marginal, tube conical, long ..... Burlovka
tube funnel-shaped ..... Streaked Naliv
Stamens median, core closed, meeting ..... Bode
core wide open, clasping. Blushed Calville
Surface highly polished, white, much bright blush .. Lubsk Queen

Midsummer to Early Winter

Flesh sweet

Large, oblong conic, regular, cavity acute ..... Sweet Longfield
Stem very fleshy, cavity nearly flat ..... Czar's Thorn
Medium or below, oblong conic, angular, cavity much russeted, ... Sweet Pipka
round, truncated, blushed ..... Sweet Pear
conical, surface oily ..... Ostrakavis
Above medium, roundish oblate, cells ovate ..... Prolific Sweeting

Flesh subacid or acid, surface with no blush

Flesh yellow; tube funnel-shaped

Stamens marginal ..... University
Stamens median, size large ..... Antonovka and Bergamot
Stamens median, size small ..... Yellow Ingestrie

Flesh yellow; tube conical

Surface more or less russeted ..... Perry Russet
Stamens basal ..... Grimes Golden
Stamens median ..... Bergamot

Flesh white with green veinings

Oblate ..... Rambour Reinette
Oblong conical ..... Simbrisk No. 9

Flesh white or whitish, tube conical

Stamens basal, cavity much russeted ..... Giant Swaar
cavity faintly russeted ..... Mollie
Stamens median, cells ovate ..... Gruskirka
cells round ..... Wilcox
Stamens marginal, stem very short ..... Tiesenhausen

Flesh white or whitish, tube funnel-shaped

Stamens median, cells obovate ..... Utter (rarely)
Stamens marginal, surface uneven ..... Speer
core wide open ..... Barker
core closed ..... Lead
Stem long, stout, core wide open ..... Calville of Abbotsford
Flesh white or whitish; form small, conical, angular ..... Pineapple
Size medium, roundish oblate, polished ..... Kluevskoe
Size large, roundish; dots large, suffused, white, few .. London Pippin
Size medium, oblate conical, stem long ..... Knowles pippin

Flesh subacid or acid; surface with blush

Color of flesh not given; cells obovate, tube conical, stamens median ..... American Codling
tube funnel-shaped, stamens median ..... Harding

Flesh yellow or yellowish white

Stem very short; oblate; basin broad, very shallow ..... Tubbs Ironclad

Tube conical

Stem long to very long ..... Ostrakoff
Stem short; seeds few, short, very large ..... North Star
Stem short; seeds large, long ..... Duchess No. 8

Tube funnel-shaped

Stamens median ..... Dyer
Stamens marginal; form sharply conical .... Clarks Prolific
form roundish truncated ..... Waxen

Flesh white

Fruit large, roundish oblong, segments long, narrow .....
..... Dansic Pipka
Fruit medium, roundish, somewhat truncated, segments connivent ..... Good Peasant
Fruit large, very regular; cells elliptical; seeds large, long,
..... Arabka and Arabskoe

Tube conical; stamens basal

Cavity much russeted
Roundish oblate, conical ..... Sklanka
Roundish, truncated, angular ..... Vargul
Cavity russeted
Large, roundish, somewhat conical ..... McMahon

Tube conical; stamens median

Medium, oblate, regular ..... Wabasha
round conic, regular ..... Queen Muscatel
round, truncated ..... Duchess X Iowa Keeper

Tube conical; stamens marginal

Flesh greenish white, green veinings ..... Lead
Round, very regular ..... Fonaric
Roundish oblate, segments very long, pointed .... Ledenets
Oblate to roundish oblate; segments very small. Sandy Glass

Tube funnel-shaped, stamens median

Large, dots green ..... Patten Greening
Medium; basin narrow, abrupt, wrinkled ..... Longfield
Medium; oblong oval; basin broad, shallow .... Leach No. 5
Rather small; seeds packed tightly in cells ..... Iowa Blush
Small; basin wide, deep, smooth ..... Arcad

Tube funnel-shaped, stamens marginal

Medium, oblate ..... Daisy
oblate conical ..... Peach
roundish oblate, stem long ..... Catherine
roundish, regular; cells ovate ..... Cresco
Large, roundish oblong conical ..... Gideon
oblong, regular; cells elliptical .....
..... Cotterals Seedling No. 1

Midwinter to Spring

Size large; oblate; dull green with bronze blush.....Hotchkiss
small; depressed oblate, stem very long .....Zwiebel Borsdorfer
medium to large; oblong, angular, ribbed; yellow .....Chisman

Flesh yellowish white, yellowish or yellow

Size small, roundish, truncated, cylindrical.....Burlington
Size medium to large, roundish, regular, inclined, basin wide, shallow, wavy .....Goode

Tube conical; stamens median

Cavity wide, shallow, usually lipped .....Roman Stem
Cavity acute, regular, russeted .....Malinda

Tube funnel-shaped; stamens median

Large, very regular, oblate truncated.....Volga Cross
Large, irregular, angular, roundish oblate.....Newell
Large to very large, roundish oblong, slightly conical.....
.....Northwestern Greening

Tube funnel-shaped; stamens marginal

Medium, roundish, conical, sometimes oblique.....Allington

Flesh white, whitish or greenish white

Cavity deep, narrow, funnel-shaped; cells obovate..Oxford Orange
Oblong, conical, angular; basin shallow, wavy.....Avista
Roundish, slightly conic, basin shallow, narrow, finely wrinkled
.....Evaline

Tube conical; stamens basal

Flesh white, with green veinings .....Red Queen
Cells obovate.....Bogdanoff
Cells elliptical.....Golden Ball

Tube conical, stamens median

Core open, clasping, cavity wide, obtuse.....Boiken
cavity accuminate.....Rollins Pippin
Core closed, seeds very large, somewhat flattened.....Batullen
seeds about 13, short, plump .....Kievskoe

Tube conical, stamens marginal

Yellow; stem very short .....Superb
Green; stem very long ..... Bon Homme Co.

Tube funnel-shaped, stamens basal

Large; seeds about 17; cells ovate.....Deoma
Small; seeds few..... .....Kaump

Tube funnel-shaped, stamens median

Small, roundish regular, seeds few .....Kaump
Medium or above, nearly gobular; flesh sweet...Tolman Sweet
Large, roundish conical, very regular.....Romna
roundish oval, seeds many, loose in cells.....Thompson
conical, very regular, cells elliptical....Vochins Crimean

Tube funnel-shaped, stamens marginal

Basin flat, core open ..... Wrights Seedling
core closed ..... Rollins Prolific
Basin wide, slightly wrinkled, stem long ..... Leipsic Borsdorf

CLASS D. STRIPED; surface more or less striped and splashed.

Tube and stamens not described

Season summer, very early; tube long, narrow ..... Vineuse Rogue
early; basin nearly flat ..... Safstaholm
Season fall; flesh white, stained red next the skin. Peterson Seeding
basin wide, nearly flat, much corrugated .. Elgin Beauty
basin wide, shallow, smooth ..... Ness
size large ..... Hutchins
of Duchess type; Glass Green ..... Arabian, Anisovka
of Wealthy type ..... Advance
Season late winter; basin abrupt, deep, nearly smooth ..... Eureka
Season winter; basin wide, shallow, wrinkled. Transcendent Seedling

Tube conical; stamens basal

Cells ovate; flesh white or yellowish white .....
..... Alexander; Aport 23 M; Red Aport
Flesh yellow; season August ..... Aport Orient
Flesh orange yellow; season September, October .... Clarks Orange
Season winter; calyx wide open to core ..... Cellini
calyx wide open; basin deep, abrupt ..... Grundy
cavity much russeted ..... Grandmother
cells obovate; flesh excellent ..... Jonathan
cells elliptical, roomy ..... Perkins No. 32
cells round ..... Perkins No. 46

Tube conical; stamens median

Summer to late fall

Very early summer ..... Charlottenthaler
Flesh orange yellow ..... Clarks Orange
Flesh yellow; surface polished ..... Dudley
basin obscurely 5-sided ..... Iowa Beauty
Flesh yellowish; basin wide, deep, abrupt ..... Ackers Duchess
Flesh white, some green veinings ..... Flat Voronesh
Flesh white, stained with red ..... Mountain Beet
Flesh sweet ..... Glass
Flesh white, with yellow veinings ..... Varguelk
Stripes overlaid with whitish bloom ..... Romianka
Core outline green, distinct ..... Anis
Stem long and stout ..... Revel Pigeon
Calyx wide open to core ..... Cellini
Cavity much russeted ..... Grandmother

Cells obovate; stripes very distinct ..... St. Lawrence
stripes less distinct ..... Redpath Fall Seedling
basin ribbed, deep, abrupt ..... Red Mushroom
Cells ovate, roomy; segments connivent ..... Perkins No. 78
segments erect convergent ..... Fosburg
Basin obscurely 5-sided, corrugated ..... Iowa Beauty
Basin wide, very abrupt, corrugated in bottom .....
..... Polisher Herrenapfel
Basin narrow, nearly flat; form sharply conical ..... Aluska
smooth, abrupt ..... Douglas No. 3
corrugated ..... Blue Anis

Tube conical; stamens marginal

Basin very shallow, narrow ..... Roxanna
almost flat; cells ovate ..... Peterhof
Basin shallow, wide, corrugated ..... Riepovka
Basin flat, corrugated ..... Crooked Spike
Fruit very large, handsome ..... Vasilis Largest and Zolotareff
Cells elliptical, abaxile ..... Rattle
axile; seeds many ..... Getman
Cells round, axile ..... Borovinka
Flesh stained with red; seeds about 14 ..... White Pigeon
size very large .....
..... Vasilis Largest and Zotareff
Flesh whitish with green veinings ..... Vorgunox

Tube funnel-shaped; stamens basal

Summer and early fall
Flesh white with green veinings ..... Riga Stripe
Flesh white; cells elliptical ..... Chenango
Flesh white, often stained with red; cells round ..... Wealthy
Flesh yellow; cells ovate ..... Gladstone
Season winter; cells obovate ..... Stenkyrka

Tube funnel-shaped; stamens median

Seeds rattle loose in the ripe fruit ..... Saxton
With heavy blue bloom ..... Charlamoff
Flesh sweet
Seeds small, many ..... Green Sweet
large, long ..... Beautiful Arcade
flesh very yellow ..... Isham Sweet
cavity much russeted ..... Price's Sweet

Season very early summer

Core meeting ..... Early Champagne
Cells obovate, abaxile ..... Red Astrachan
Tube broad, long ..... Tetofsky

Season summer to early winter

Tube open to core; calyx wide open ..... Cellini
calyx half open; very large ..... Kavelos
flesh stained ..... Haas
cavity much russeted ..... Recumbent
Core very small; cells round ..... Milwaukee
Core small, meeting; basin deep, corrugated .....
..... Titovka Department
Segments very large, leafy, erect convergent ..... Estaline
Segments very long; fine blue bloom ..... Titovka Speer
Color with much dotted red; cells obovate ..... Utter
Cavity shallow, narrow; basin wavy, wrinkled ..... Mallett
Cavity with large radiating russet patch ..... Hibernal
Basin shallow, narrow corrugated ..... Golden White
abrupt, wavy ..... Cross 15M
narrow, very abrupt, wavy . Mitchell's Red Warrior
Flesh stained with red; cells round ..... Wealthy or Peter
segments very long, ... Titovka Speer
Flesh snow white; tender ..... Vochins Crimean (Mitchell's)
Cells ovate; segments long, broad ..... Oldenburg
fruit small ..... Cinnamon Pine
Seeds very large, flat ..... Minnesota Gilbert
Seeds large, many, flattened, basin ribbed ..... Voronesh Cross
Seeds few, short, plump; core sessile; flesh yellow ..... Titovka
Seeds very few, flattened, pointed ..... Pound

Season midwinter to spring

Cells round, oblong conical ..... Repka Malenka
tube long, wide ..... Milwaukee
Cells obovate; fruit large ..... Ben Davis
Cells ovate ..... Ralls Genet
cavity narrow, acuminate ..... Sheriff
Cavity shallow to flat, often lipped ..... Pewaukee
Flesh whitish yellow; seeds small ..... Windsor Chief
Seeds large flat ..... Peffer's Duchess X Ralls Genet
Tube long, narrow, open to core ..... Arthur

Tube funnel-shaped; stamens marginal

Flesh sweet

Cavity much russeted ..... Sweet Borovinka
Cells ovate; core closed ..... Sweet Wealthy
Tube long ..... Beautiful Arcade

Flesh subacid or acid

Season summer and early fall

Flesh stained with red; core closed ..... Moscow Pear
core open ..... Lowland Raspberry
Surface highly polished; handsome ..... Lubsk Queen
Surface with heavy blue bloom ..... Green Butskaya

Stem very short, thick, fleshy; fruit small. Garden (Kustoe)
Color dulled with whitish net-veining ..... Early Prolific
Seeds large, long, pointed; flattened ..... Jersey Beauty
Seeds very large, packed tightly in cells .. Richland Beauty
Tube wide, open to core; basin very shallow ..... Serinkia
segments long, acute .....
..... Russian Gravenstein
basin medium ..... Schroeder
Tube long, wide ..... Alabaster White
narrow ..... Noregon
Cells round, core outline distinct, greenish yellow .....
..... Prices Choice
Cells obovate, season very early ..... Red Astrachan
fruit very large ..... Zolotareff
Cavity with large russet patch ..... Saxonian
Basin almost flat, narrow ..... Winter Pear
Basin shallow, somewhat ribbed ..... Imperial Citron
Basin broad, deep, very abrupt ..... Mottled Anis
shallow, wrinkled ..... Mills

Season late fall to early winter

Tube long, broad ..... Okabena
Calyx wide open to core ..... Cellini
Surface with blue bloom ..... Lightly No. 16
Cavity with raidiating green ..... Peerless
Basin flat, corrugated ..... Christmas
wrinkled ..... Wm. Johnson
Core wide open; cells ovate ..... Okeroe
Stamens extremely marginal; flesh greenish white ....
..... Plumb Cider
flesh snow white .. Hamburg

Season late winter

Basin flat, narrow ..... Walbridge
Basin shallow, narrow, plaited ..... Winesap
Basin shallow, wide, wrinkled ..... Leona
Basin narrow, abrupt, shallow, wrinkled ... Repka Malenka
Basin narrow, very abrupt, wrinkled ..... Clines Seedling
Basin smooth, abrupt, regular ..... Adaline
Basin abrupt, smooth, wavy; tube long ..... Oakton