New York Agricultural Experiment Station.

GENEVA, N. Y.

NEW YORK APPLES IN STORAGE.

S. A. BEACH AND V. A. CLARK.

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* Connected with Fertilizer Control.
† Absent on leave.
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BULLETIN No. 248.

NEW YORK APPLES IN STORAGE.
S. A. BEACH AND V. A. CLARK.

INTRODUCTION.

This bulletin treats of different varieties of apples with regard to their natural season of ripening and keeping and their adaptability for storage. The material has been obtained from three distinctly different sources. First, from tests made at this Station on fruit which was grown in the Station orchards and stored in a small warehouse without artificial refrigeration; second, from men who have had years of practical experience in handling fruit, both in cold storage and in ordinary fruit warehouses; and third, from tests made by the United States Department of Agriculture in cooperation with this Station on numerous varieties of apples from the Station orchards in chemical cold storage, the results of which have quite recently become available.

The primary purpose of the tests which were made at this Station was to determine the ordinary season of ripening and the keeping qualities of the different varieties of apples which were being grown in the Station orchards. These tests brought out some results of general interest concerning the keeping of apples which are worthy of publication, but which are quite incomplete when regarded from the standpoint of the general adaptability of these varieties to storage purposes.

In order that we might be able to present a still more complete account of the behavior of different sorts of apples in storage than could be derived from our experiments it seemed good to consult on this subject those men who have had experience in storing apples on a large scale under commercial conditions. Accordingly, the following list of questions was sent out to a number of storage men:
VARIETY

How many years' experience in handling apples?

Under what other names do you know this particular variety?

How does it compare with either Hubbardston, Tompkins King, Rhode Island Greening, Baldwin or Ben Davis. For holding in chemical cold storage, for holding in ice cold storage, for holding in common and cellar storage?

What peculiarities, if any, does it show in manner of final deterioration in chemical cold storage, such as (6) scald, (7) loss in quality, (8) color, (9) firmness before decay sets in, (10) skin becoming bitter, (11) fruit shriveling or (12) becoming mealy or (13) bursting after becoming mealy?

Does it go down in chemical cold storage gradually or quickly?

At what temperature should it be held?

What is its season in chemical cold storage, ice cold storage, cellar storage?

To what extent does its keeping quality vary in different seasons?

How does this variety stand heat before reaching cold storage?

The following parties responded to our circular:

J. H. Bahrenburg, Bro. & Co., New York City; 20 years' experience.


B. Fenton of the Erie Preserving Co., Buffalo, N. Y.; over 30 years' experience in handling apples in common storage.

W. D. Graham of W. D. Graham & Son, Minneapolis, Minn.; 40 years' experience in growing and shipping apples.


G. W. Hickox, Batavia, N. Y.; 20 years' experience.

Chas. A. Hoag, Lockport, N. Y.; 25 years' experience in growing and storing apples.

A. C. Howes, Albion, N. Y.; 30 years' experience.

Benj. Newhall of F. Newhall & Sons, Chicago, Ill.; 25 years' experience. The house has 55 years' experience.

G. W. Payne, Rochester, N. Y.; 20 years' experience with apples in cellar storage.

Phillips Bros., Castile, N. Y.; 20 years' experience.

D. L. Prisch, Middleport, N. Y.; 15 years' experience.

J. M. Shuttleworth, Brantford, Ontario, Canada; over 30 years' experience.

T. B. Wilson, Hall's Corners, N. Y., who has had many years' experience in growing apples and holding them in common storage, has read in manuscript the parts of this bulletin based on the experience of storage men and has made many suggestions.

The summary of the experience of cold storage men (pp. 91
to 110) was read in proof by the following gentlemen, who made many suggestions: D. S. Beckwith, Albion, N. Y.; A. C. Howes, Albion, N. Y.; B. Frank Morgan, Albion, N. Y.; Chas. A. Hoag, Lockport, N. Y.

Chas. Shafer, Gasport, N. Y., furnished a number of notes on the comparative efficiency of ice storage and chemical cold storage.

The authors acknowledge their obligation to all these gentlemen who have so generously assisted them by filling out the circulars or by reading proof.

The recent publication by the United States Department of Agriculture of results of its tests of varieties in chemical cold storage in cooperation with this Station gave opportunity for supplementing the results of the Station's tests in natural temperature storage with tests of fruit from the same orchards in cold storage.

In 1901 and 1902 the Station furnished 109 varieties of apples, picked and packed the same, and consigned them to the Department of Agriculture at Buffalo where the tests were made by Profs. G. Harold Powell and S. H. Fulton. The results of their work are reported in Bulletin 48 of the Bureau of Plant Industry, which was issued while this bulletin was being prepared for the printer and from which the notes on these tests in this bulletin are taken. Tests with fruit from other localities were in progress at the same time but only those tests with fruit from this Station are reported in this bulletin except as otherwise noted.

THE STATION TESTS.

The Station tests were made during a period of four years with a large number of varieties (165) of apples which were stored in the Station fruit house with no artificial refrigeration. The details of this investigation were carried out by C. P. Close, then Assistant Horticulturist at this Station. As already stated the primary purpose of the tests was to find out the season of ripening of the different varieties and the length of time during which they would keep in sound condition under natural temperature conditions. The fruit which was used in these tests was all grown in the Station orchards, as was also that used in the Department cooperative tests.
THE ORCHARDS.

These orchards are located on the upland about one and one-half miles west of Seneca Lake at an altitude of about 600 feet above sea level. The trees from which most of the fruit was taken have mostly been top-grafted upon young trees of bearing age. The tops varied in age from 15 to 20 years from the graft. A few were either young trees or old trees not top-grafted. The soil is a rather heavy clay loam with heavier clay subsoil. It is thoroughly tile drained. Thorough tillage was given till mid-summer after which some cover crop was sown. The trees were well sprayed and pruned. The fruit usually was not thinned. No stable manure has been given to the trees at any time so far as is known except that one orchard of old trees was well manured in the winter of 1892–3. Acid phosphate and muriate of potash were applied in moderate amounts in 1896.

The fruit was not all picked at the same time but so far as possible the different varieties were gathered in succession in the order in which they ripened or reached suitable condition for taking from the tree and placing in storage. They were not allowed to lie in the orchard after being picked but were taken at once to the fruit house where they were stored in bushel boxes arranged in compartments which were closed with hinged covers. (Plate I.) There were no covers attached to the boxes. All fruit in storage at any one period was similarly treated so far as storage conditions were concerned except as already stated, that it was not all brought into storage on the same date.

THE FRUIT HOUSE.

The fruit house was designed expressly for storing small quantities of a large number of varieties of apples or pears. It was built in 1895. The building faces the north. It is of wood, 35x30 feet, one story with a stone-wall basement having a southern exposure. The storage room used in these tests is the natural temperature room on the first floor, opening into a vestibule with entrance from the north. Adjoining it are a show room and a room for storing ice. The ice room connects with a room below and is not concerned in these tests. The studding of the walls of the building is covered both inside and outside
with sheathing paper. The inside is covered with matched spruce, the outside with siding and the space filled with sawdust to the roof. Next to the sheathing boards inside is set another row of studs and these are also covered with sheathing paper and matched stuff. The space in this case is left empty for dead air space. The walls of the building are thus double, having a layer of sawdust without and a dead air space within. The floor, ceiling and interior partitions are constructed on the same principle. (See Plate II.)

No artificial refrigeration was used. When the outside atmosphere was cooler than that in the room the windows were opened if cooler temperature was desired. A record of the temperature at 7 A. M. and 6 P. M. was kept daily from September 12, 1896, to July 13, 1897, and from October 23, 1897, to August 14, 1898. This record shows that the temperature ranged in degrees as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Range</th>
<th>Avg. 7 A. M.</th>
<th>Avg. 6 P. M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept.</td>
<td>42 to 74</td>
<td>58.0</td>
<td>60.2</td>
</tr>
<tr>
<td>Oct.</td>
<td>37 &quot; 63</td>
<td>46.0</td>
<td>47.6</td>
</tr>
<tr>
<td>Nov.</td>
<td>29.5 &quot; 61</td>
<td>44.2</td>
<td>45.0</td>
</tr>
<tr>
<td>Dec.</td>
<td>29.5 &quot; 45</td>
<td>34.4</td>
<td>34.8</td>
</tr>
<tr>
<td>1897</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td>32 &quot; 44</td>
<td>36.2</td>
<td>35.8</td>
</tr>
<tr>
<td>Feb.</td>
<td>32 &quot; 43</td>
<td>35.1</td>
<td>34.9</td>
</tr>
<tr>
<td>Mar.</td>
<td>33 &quot; 49</td>
<td>37.7</td>
<td>38.7</td>
</tr>
<tr>
<td>Apr.</td>
<td>39 &quot; 59</td>
<td>45.3</td>
<td>46.9</td>
</tr>
<tr>
<td>May</td>
<td>45 &quot; 62</td>
<td>53.8</td>
<td>56.2</td>
</tr>
<tr>
<td>June</td>
<td>50 &quot; 70</td>
<td>60.2</td>
<td>62.7</td>
</tr>
<tr>
<td>July</td>
<td>66 &quot; 79</td>
<td>71.9</td>
<td>74.4</td>
</tr>
</tbody>
</table>

Season 1897–8.

<table>
<thead>
<tr>
<th>Month</th>
<th>Range</th>
<th>Avg. 7 A. M.</th>
<th>Avg. 6 P. M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct.</td>
<td>38 &quot; 55</td>
<td>45.7</td>
<td>50.6</td>
</tr>
<tr>
<td>Nov.</td>
<td>33 &quot; 52</td>
<td>40.2</td>
<td>41.8</td>
</tr>
<tr>
<td>Dec.</td>
<td>32 &quot; 48</td>
<td>36.5</td>
<td>37.0</td>
</tr>
<tr>
<td>1898</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td>31 &quot; 39</td>
<td>35.5</td>
<td>35.3</td>
</tr>
<tr>
<td>Feb.</td>
<td>33 &quot; 42</td>
<td>36.0</td>
<td>35.9</td>
</tr>
<tr>
<td>Mar.</td>
<td>32 &quot; 52</td>
<td>41.2</td>
<td>42.3</td>
</tr>
<tr>
<td>Apr.</td>
<td>32 &quot; 52</td>
<td>42.7</td>
<td>44.8</td>
</tr>
<tr>
<td>May</td>
<td>42 &quot; 67</td>
<td>54.3</td>
<td>56.6</td>
</tr>
<tr>
<td>June</td>
<td>55 &quot; 74</td>
<td>65.2</td>
<td>67.6</td>
</tr>
<tr>
<td>July</td>
<td>53 &quot; 80</td>
<td>69.8</td>
<td>72.9</td>
</tr>
<tr>
<td>Aug.</td>
<td>63 &quot; 78</td>
<td>68.9</td>
<td>71.0</td>
</tr>
</tbody>
</table>
The temperature doubtless fluctuated more slowly in the boxes where the fruit was kept than it did outside of the closed compartments, and therefore the variations in temperature experienced by the fruit itself must have been somewhat less than that shown in the records of the temperature of the fruit-room.

This storage house gives very satisfactory results. The efficiency of the natural temperature room is shown exactly in the table of temperature on page 87. A comparatively low temperature can be maintained in the fall by opening the windows at night and closing them during the day. In winter a single large-burner lamp holds the temperature above the freezing point of fruit in the coldest weather, even with a strong wind blowing.

**METHOD OF CONDUCTING THE TESTS.**

About 100 apples of each variety were usually included in the test where this number of proper specimens could be obtained. The conditions for the different varieties were similar. At intervals of from three to four weeks the fruit was examined and those apples which were unsound or had apparently passed marketable condition were discarded. In this manner the exact record was obtained of the length of life of each apple individually. This made it possible to determine the average life in storage of each variety and the date to which the average period of life extended under the existing conditions.

**VARIETIES IN THE STATION TESTS, ARRANGED CHRONOLOGICALLY ACCORDING TO AVERAGE LIFE.**

In the following lists are shown the varieties used in the Station tests. They are arranged in the chronological order of average lives beginning with the earliest, and for convenience grouped by half-months except in the case of the few varieties whose average life fell in October:

Varieties whose average life fell in October:
- Gracie,
- Keswick,
- Parry,
- Strode.

Varieties whose average life fell in the first half of November:
- English Pippin,
- Alexander,
- Pound Sweet,
- Chenango,
- Pomona,
- Stump.
Plate I.—View in Interior of Natural Temperature Room of Station Fruit House.
PLATE II.—FIRST STORY PLAN OF STATION FRUIT HOUSE.
Varieties whose average life fell in the last half of November:
  Boskoop,                       Jersey Sweet,
  Elgin,                         Krim tartar,
  Pumpkin Russet,                Haskell,
                                  Longfield.

Varieties whose average life fell in the first half of December:
  Ohio Pippin,                   Gravenstein,
  Heidorn,                       Longworth,
                                  Tufts.

Varieties whose average life fell in the last half of December:
  Haas,                          Tobias,
  Ostrakoff,                     Washington Strawberry,
  St. Lawrence,                 Romna,
                                  Ginnie.

Varieties whose average life fell in the first half of January:
  Admirable,                    Aucuba,
  Tobias Pippin,                Gideon,
  Magog,                        Disharoon.

Varieties whose average life fell in the last half of January:
  Jefferis,                      Wolf River,
  McMahon,                      Farnese,
  Stanard,                      Crotts,
  Twenty Ounce,                Henniker,
  Blenheim,                     Jewett Red,
  Mother,                      McIntosh,

Varieties whose average life fell in the first half of February:
  Pomme Grise,                   Pumpkin Sweet,
  Clarke,                       Barbel,
  Victoria,                     Wealthy,
  Hurlbut,                      Peter,
  Kalkidon,                     Jacobs Sweet,
  Rhodes,                       Flory,
                                  Fall Pippin.

Varieties whose average life fell in the last half of February:
  Milligen,                      Cogswell,
  Pewaukee,                      Grimes,
  Northern Spy,                  Fall Wine,
  Falix,                         Landsberg,
  Brownlee,                      Jonathan Buler,
  Greenville,                    Celestia,
  Maiden Blush,                  Dickinson,
  Etowah,                        Borsdorf.
Varieties whose average life fell in the first half of March:

- Sharp, Tolman Sweet,
- Peach, Buckingham,
- Hubbardston, Northwestern Greening,
- Smith Cider, Swenker,
- Milden, Melon,
- Tompkins King, Domine,
- Duke of Devonshire, Dumelow,
- Reinette Pippin, Rambo,
- Marigold, Ca nada Baldwin,
- Yellow Bellflower, Ornament.

Varieties whose average life fell in the last half of March:

- Canada Reinette, Golden Medal,
- Esopus Spitzenburg, Peck Pleasant,
- Farris, Sutton,
- Monmouth, Coon,
- Moon, Rhode Island Greening,
- Scott, Washington Royal,
- Red Russet, Ronk,
- Golden Russet, Wallace Howard.

Varieties whose average life fell in the first half of April:

- White Pippin, Caux,
- Kansas Greening, White Doctor,
- Menagère, Ewalt,
- Holland, Salome,
- Mann, Streaked Pippin,
- Jonathan, Arkansas,
- Olive, Duncan,
- Swaar, Kittageskee,
- Walbridge.

Varieties whose average life fell in the last half of April:

- Moore Sweet, Ontario,
- Lankford, Fallawater,
- Yellow Forest, Roxbury,
- Newtown Spitzenburg, Rome,
- Occident, Lady Sweet,
- Vanhoy.

Varieties whose average life fell in the first half of May:

- Kansas Keeper, Wagener,
- Gideon Sweet, York Imperial,
- Cooper Market, Newman,
- Lawver, Texas,
- Chase, Large Lady,
- Baldwin.
Varieties whose average life fell in the last half of May:
- Jones,
- Edwards,
- Stark,
- Kirtland,
- Ralls,
- Winesap,
- Ben Davis,
- Zurdel,
- Nelson.

Varieties whose average life fell in the first half of June:
- Green Newtown,
- Andrews,
- Pifer,
- Red Canada.

The average life of Schodack extended to July 18.

It is important to remark that the date to which the average life of the fruit in storage extended does not necessarily coincide with the date when the fruit of that particular variety was half gone. Thus 100 specimens of Arkansas were put into storage October 14, 1897. On November 23, 8 were discarded; on December 20, 4; on February 1, 4; on March 4, 15; on March 22, 5; on April 4, 14; on April 21, 1; on May 6, 8; on May 24, 9; on June 11, 28; on June 30, 6. The average life of the fruit from the time it was put into the storage extended to April 12, but the fruit was half gone on April 4. Neither does the average life coincide necessarily with the commercial limit.

EXPERIENCE OF STORAGE MEN.

A summary of the information gained from practical storage men is presented under the following heads:
- Conditions affecting the keeping quality of apples.
- Comparative efficiency of different kinds of storage as applied to different varieties.
- At what temperature should different varieties be held?
- Relation between seasonal differences and keeping quality.
- Kinds of deterioration that may precede rotting in storage, and varieties liable to each:
  1. Scald.
  2. Loss in quality.
  3. Change in color.
  4. Loss in firmness.
  5. Becoming bitter.
7. Becoming mealy.
8. Bursting.
9. Rapidity of going down.
   (a) List of those that go down gradually.
   (b) List of those that go down quickly.
10. Endurance of heat after picking and before going into storage.
   (a) List of those enduring heat comparatively well.
   (b) List of those not enduring heat well.

CONDITIONS AFFECTING KEEPING QUALITY OF APPLES.

The keeping quality of apples is influenced by many conditions, among which are the ripeness of the fruit, season, manner of picking, packing and handling, kind of storage, presence of fungi and temperature at which the fruit is stored. Overgrown specimens do not keep so well as those of medium size. Morgan remarks that thick-skinned varieties generally keep better than thin-skinned ones.

Keeping quality is often correlated with degree of coloring up of the fruit. To keep best, colored apples should be picked only after they are well colored but while they are still firm. According to Wilson, this point is reached when the plump seeds are black. But in order to keep longest in cold storage Rhode Island Greenings must be picked while they are still very green and hard. They will then carry through without any scald until very late in the season. But Rhode Island Greenings appear to hold best in common storage when they have ripened well on the tree, as is Wilson's experience (see p. 141). According to Howes Rhode Island Greenings are in condition for picking for longest holding in cold storage when the bloom on the fruit rubs off easily and leaves the skin rather shiny. This rule is said to apply less markedly to Baldwins and probably to other varieties.

Methods of harvesting, packing and handling in transportation have the greatest influence on keeping quality. Handlers of apples sometimes roll barrels of fruit, allowing them to strike against other barrels. This rough handling may bruise the fruit almost to the middle of the barrel. But some varieties are more easily injured by rough handling than are others. Northern Spy is one of the easiest to bruise and barrels are often found to go down in storage early on this account. Tolman
**Sweet** and Yellow Bellflower are other varieties very sensitive to rough handling.

Storage men emphasize and reiterate the point that cold storage can only be successful when fruit is handled very carefully—more carefully than fruit is now often handled. At the same time it is important that only No. 1 fruit be stored. Not only is there little profit in storing No. 2 fruit but when it goes on the market it hurts the sale of No. 1 fruit.

The seasons given in this bulletin for the different varieties are for fruit carefully picked, packed and otherwise handled according to the most approved methods.

Certain differences in the management which the trees receive result in corresponding differences in the keeping quality of the fruit. For example, apples grown in sod attain to a higher color and keep longer than those grown under clean culture.

The soil on which the tree grows makes a difference with the keeping quality of the fruit. Baldwins grown on sandy or gravelly soil ripen earlier and must be picked earlier and do not keep so well as those on clay soils, although they have a higher color.

The presence of fungi is liable to shorten the life of fruit. Fameuse and many other varieties when affected by scab keep very poorly in storage. Fruit affected by certain other fungi keeps well until it reaches a certain stage of ripeness and then goes down quickly. Beckwith finds that if Baldwins are very badly affected by fungus, they hold longest in cold storage if picked quite green. Fruit affected with fungus keeps best in a cold dry atmosphere. This point was clearly brought out by experience in 1902.

But except for retarding the development of fungus, apples keep best with considerable moisture in the air. Such is the opinion of many storage men, among them Hoag and Beckwith. Hoag remarks that Roxburys, especially, keep much better if they are rather damp.

In recent years cold storage men have generally come to believe that apples should go into storage as soon as picked. With the Hubbardston, however, Wilson still believes that it is best to let the fruit lie on straw on the ground for two or three weeks for the purpose of adding color to the fruit. This can be done,
perhaps, with this variety because it is not a good variety for storing anyway and goes soon into consumption. But cold storage men are agreed that, although this practice may put the fruit in better condition for immediate use, it injures its keeping quality.

Some varieties, as McIntosh, ripen very unevenly. If all the fruit is picked from a tree of such a variety at one picking, there results a mixed lot of differing degrees of ripeness, and the season of the ripest fruits determines the season of the whole lot. The harvesting of such varieties should be divided between two or more pickings. In parts of the west, it has become an established practice to pick some varieties of apples in the same way that peaches and oranges are picked, going over the trees a number of times and taking each time only those fruits that have reached the required degree of ripeness. As a result the different fruits in any such lot are very uniform in keeping quality and the percentage of No. 1 fruit is greatly increased. The small packages used by Oregon fruit-growers for their apples and the high prices obtained for the fruit make the practice profitable there.

Some growers have, in the last few years, adopted the practice of picking early apples, especially Oldenburg, in this way, and the practice is gaining. In this case the earliness of the season gives time for several pickings; but when the main crop of fruit comes on it must be harvested all at once in order to get through picking in time. Although the desirability of making two or more pickings is commonly admitted it does not seem to be generally practicable under present conditions and methods of apple orcharding in New York State. The practice is for the grower of early or fancy fruit or of fruit for local markets rather than for the growers of the ordinary commercial varieties of winter apples. Yet there is a feeling, especially among dealers, that this is a coming practice.

It is a matter of common observation that specimens that are very large for the variety do not keep so well as those of medium size and firmer texture. This is remarked by several cold storage men. Such fruit may be produced on young trees or on mature trees making excessive growth or carrying a light crop.
COMPARATIVE EFFICIENCY OF DIFFERENT KINDS OF STORAGE AS APPLIED TO DIFFERENT VARIETIES.

The efficiency of the various kinds of storage as applied to different varieties differs greatly. For instance, according to Hart, the season of both Fallawater and Grimes in cellar storage is January; but the season of Fallawater in chemical cold storage is May, a lengthening of the season by 4 months, while the season of Grimes in chemical cold storage is February, a prolongation of the season of only 1 month.

Again, the season of Missouri Pippin and York Imperial in cellar storage is given by Newhall as December; but that of Missouri Pippin under ice is April, a prolongation of the season by 4 months, while the season of York Imperial is extended only 1 month or until February.

Nor is there any constant difference for all varieties in their season in storage under ice and in chemical cold storage. For instance, Graham gives the season of both Baldwin and Hendrick in storage under ice as May 1; but he gives the season of Baldwin in chemical cold storage as June 15, or an increase of one and one-half months, while the season of Hendrick is stated as May 15, or an increase of only one half month.

As to the difference in season of varieties in cellar and in chemical cold storage, Howes makes this uniformly 60 days, i.e. 2 months, for all varieties. Newhall makes it 1 month for 5 (early fall) varieties, 2 months for 19 varieties, 3 months for 23 varieties, 4 months for 8 varieties and 5 months for Northwestern Greening. Graham makes this difference variously from ½ month to 3 months. Hart makes this difference 2 months in a large majority of cases, with extremes of 1 and 4 months. The seasons of the varieties reported on by Newhall, Graham or Hart in the different storages, as given by these parties, is shown in Table II.
### Table II.—Seasons of Certain Varieties of Apples in Various Storages.

<table>
<thead>
<tr>
<th>Variety</th>
<th>As reported by</th>
<th>Season in</th>
<th>Difference in season between</th>
<th>Mos</th>
<th>Mos</th>
<th>Mos</th>
</tr>
</thead>
<tbody>
<tr>
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1 Newhall. 2 Graham. 3 Hart.
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1 Newhall. 2 Graham. 3 Hart.
### Table II.—Seasons of Certain Varieties of Apples in Various Storages.—Concluded.

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</table>

1 Newhall. 2 Graham. 3 Hart.

As to the relative efficiency of cellar and ice storage as applied to different varieties, Newhall reports that the season of 19 varieties is prolonged by ice storage 1 month beyond their season in cellar storage, 28 varieties 2 months, 8 varieties 3 months and 2 varieties 4 months. Graham gives the prolongation of season as from \(\frac{1}{2}\) month to 2\(\frac{1}{2}\) months for different varieties. Hart reports this difference as 1 month for 7 out of 9 varieties.

As to the relative efficiency of storage under ice and of chemical cold storage, Newhall assigns the same season in either storage to
14 varieties. In the case of 40 varieties Newhall finds that chemical cold storage lengthens the season by 1 month as compared with storage under ice and in the case of 2 varieties the season is lengthened 2 months. Hart reports 7 varieties as keeping 1 month longer in chemical than in ice storage. Graham assigns to one-half of the varieties he reports on a lengthening of the season by $\frac{1}{2}$ month in chemical storage, but in other cases this difference varies from $\frac{3}{2}$ month to $1\frac{1}{2}$ month.

Shafer estimates the life of fruit in chemical cold storage as 60 days longer than the same varieties under ice, though in very cool seasons such as that of 1903 there is, he says, hardly any difference in the keeping quality of the fruit in the two storages.

Ice storages have several disadvantages. After warm fruit is put in, it takes some time to get it cooled off and in the meantime the ripening processes is going on. The temperature cannot be held so low as it can with mechanical refrigeration, $38^\circ$ to $40^\circ$ being about the temperature in an ice storage, which however is held quite even at this temperature. Then about one-third of the air space in the building is occupied by the ice storage. So far as large commercial operations are concerned, ice storage is a thing of the past. It is a significant fact that no new ice storages are being put in.

**AT WHAT TEMPERATURE SHOULD DIFFERENT VARIETIES BE HELD?**

Some correspondents appear to hold all varieties at about the same temperature, while others vary the temperature according to the variety. While practices differ in individual cases a general principle can be detected running through and guiding practice in general. It is, that varieties that keep long and go down slowly are held at about $31^\circ$ to $32^\circ$, while early ripening varieties and those that do not keep so well are held one or two degrees higher, that is, at $33^\circ$ to $34^\circ$. In a few cases shorter lived varieties are held at a lower temperature than the long lived ones, that is, at a little under $32^\circ$.

The early apple, when held at a low temperature, loses in quality and when it comes out of storage it goes down quicker than if held at the higher temperature. Moreover, some fruit
as, for instance, that of the ordinary Twenty Ounce, freezes at a higher temperature than does other fruit like the ordinary Baldwin, and for this reason aside from others must be held higher.

It is well known that very large specimens of a given variety do not keep so well as medium sized or small ones. Newhall makes practical application of this fact in that he holds average sized Rhode Island Greenings, at 32° but large ones at 33°; also in that while he commonly holds Hubbardstons at 33°, if the fruit is under size it is held at 32°. On the contrary, Morgan and others hold all fruit of the same variety at the same temperature irrespective of size.

Howes holds all varieties reported on at 32°. Similarly Hart holds all varieties for which this question is answered at 30° to 32° except Hubbardston which is held at 30°. Graham holds most varieties at 32° but a few at 33°. Newhall holds most varieties at 32° or 33°, but summer and early fall varieties as high as 34° or even 35°. Phillips Bros. hold at various temperatures, ranging from 30° to 35°. The varieties on which each of these parties reported on temperature are shown in Table III with the respective temperatures reported. Fenton reports on Baldwin, Ben Davis, Northern Spy, Rhode Island Greening, Tompkins King and Twenty Ounce, recommending that each be held close around 32°. Beckwith agrees with the recommendations of temperatures for all varieties in Newhall's list with which he has had experiences and to that list adds Baldwin, Ben Davis, Black Gilliflower and Roxbury, all to be held at 32°.
### Table III.—Temperatures at Which Varieties Are Held by Graham, Hart, Howes, Newhall and Phillips.

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<td></td>
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<tr>
<td>Pomme Grise</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
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</tr>
</tbody>
</table>

1 "If of average size, 32° if large."  2 "If held at all."  3 Should be held even.  
4 "32° if under medium size."  5 "Usually."  6 "As nearly as possible."
### Table III.—Temperatures at which Varieties are Held by Graham, Hart, Howes, Newhall and Phillips.—Continued.

<table>
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<tbody>
<tr>
<td>Pumpkin Sweet</td>
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<tr>
<td>Ralls</td>
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<tr>
<td>Rambo</td>
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<tr>
<td>Red Canada</td>
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<tr>
<td>Rhode Island <em>Greening</em></td>
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<tr>
<td>Ribston</td>
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<tr>
<td>Ridge</td>
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<tr>
<td>Roman Stem</td>
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<tr>
<td>Rome</td>
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<tr>
<td>Roxbury</td>
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<tr>
<td>Salome</td>
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<tr>
<td>St. Lawrence</td>
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<tr>
<td>Shiuwassee</td>
<td></td>
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<tr>
<td>Smith <em>Cider</em></td>
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<tr>
<td>Stark</td>
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<tr>
<td>Swaar</td>
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<tr>
<td>Tolman <em>Sweet</em></td>
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<tr>
<td>Tompkins King</td>
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<tr>
<td>Twenty Ounce</td>
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<tr>
<td>Wagener</td>
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<tr>
<td>Walbridge</td>
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<tr>
<td>Wealthy</td>
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<tr>
<td>Westfield <em>Seek-no-further</em></td>
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<td></td>
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<tr>
<td>Winesap</td>
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<tr>
<td>Winter Banana</td>
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<tr>
<td>Yellow Bellflower</td>
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<tr>
<td>Yellow Newtown</td>
<td></td>
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<tr>
<td>York Imperial</td>
<td></td>
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</tbody>
</table>

1 "Should be held even." 2 "If of average size, 33° if large." 3 "If held at all." 4 "For short season."

**Relaion between Seasonal Differences and Keeping Quality.**

It is well known that apples vary much in keeping quality in different seasons. It is also a common observation that they keep much better if the month of October is cool than if it is warm. This fact is often remarked, especially by Fenton, Howes and Graham. Fenton remarks that Baldwins keep four to six weeks longer in cellar storage if the month of October is cool than if it is warm. Similarly Northern Spy keeps a month longer.
Howes remarks that apples keep better after a dry season than a wet one. "But," he continues, "the season of 1902 was a wet one and still apples kept as well as any season. This of course refers only to apples not affected by any disease."

Beckwith remarks that the best growing season for apples is a rather cool summer with plenty of rain the first part of the season and dry, even weather the latter part, as in 1903. Apples grown such seasons keep best.

Some varieties, such as Hubbardston, Northern Spy and Twenty Ounce do not color up well some seasons and Russets may not become well russeted. In both cases the result is the same as when fruit is picked too green and put into storage. Its keeping quality is very much lessened. But Morgan remarks that highly colored Hubbardstons go to pieces in storage quicker than those not so highly colored; and Beckwith observes that, contrary to general experience, Roxburys were as good in quality in 1903 as usual though they were very green.

Some varieties, as Maiden Blush, vary greatly in time of maturing in different seasons. The earlier the fruit matures, the less satisfactory it is as a keeper. (Howes.)

Various fungous diseases are much worse some seasons than others. Fruit affected by fungus cannot be expected to keep like clean fruit. "Baldwins affected by fungus will hold as put in storage until they reach a certain degree of maturity and then begin to rot." (Howes.)

The quicker fruit is put into refrigeration the less bitter rot, pink rot and other diseases can develop.

The following varieties are reported by Howes as being comparatively little affected by differences of season:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Place of Origin</th>
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<tbody>
<tr>
<td>Cooper Market</td>
<td></td>
</tr>
<tr>
<td>Tolman Sweet</td>
<td></td>
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<tr>
<td>Yellow Bellflower</td>
<td></td>
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<tr>
<td>Roxbury</td>
<td></td>
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<tr>
<td>Tompkins King</td>
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</tbody>
</table>

Graham mentions Missouri Pippin as being in this category.

The following varieties are reported by Howes as being more affected in keeping quality by differences in season than are most varieties:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Place of Origin</th>
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<tbody>
<tr>
<td>Holland Pippin</td>
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<tr>
<td>Maiden Blush</td>
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<tr>
<td>Rhode Island Greening</td>
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<tr>
<td>Hubbardston</td>
<td></td>
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<tr>
<td>Northern Spy</td>
<td></td>
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<tr>
<td>St. Lawrence</td>
<td></td>
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<tr>
<td>Twenty Ounce</td>
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</tbody>
</table>

In this category Hart mentions Swaar and Graham mentions Fameuse.
KINDS OF DETERIORATION THAT MAY PRECEDE DECAY IN COLD STORAGE, AND VARIETIES LIABLE TO EACH.

Under the following sub-heads are given lists of varieties reported as showing certain peculiarities of behavior in deterioration in chemical cold storage.

In examining these lists it should be borne in mind that varieties often differ greatly in their manner of deterioration in different kinds of storage and under different conditions. These lists by no means indicate the unanimous experience of our correspondents. Not infrequently experiences run entirely counter to each other.

VARIETIES LIABLE TO SCALD IN STORAGE.

But few apples will scald if left on the tree until they get their color, remarks Graham, though any variety will scald if picked earlier. This of course does not apply to green fruit such as Rhode Island Greenings. But in the case of Baldwin, Wilson's experience is that it is less liable to scald if picked early, that is as soon as the plump seeds are black, than if it is left on the tree longer to get a deeper color. On the other hand "late picked Rhode Island Greenings withstand scald much longer in dry storage than do those early picked." (Wilson). But as has been already noted (p. 92), in order to keep best in chemical cold storage Rhode Island Greening should be picked quite green.

Scald appears on the shaded side of the apple first. Susceptibility to scald increases with the progress of the ripening process in cold storage. Contrary to a popular impression, the investigations of the United States Department of Agriculture have shown that scald develops more freely in a temperature of 36° to 38° than in one of 32°.

Graham remarks that Baldwins will scald after May 1 unless put into storage immediately after picking.

The following varieties are reported as scalding, sometimes early, sometimes only late in their season, and in some cases but little:

Baldwin, Canada Baldwin, Fallawater,
Ben Davis, Cooper Market, Gano,
105

Gilpin, Northern Spy, Tolman Sweet,
Grimes, Peck Pleasant, Tompkins King,
Hubbardston, Pewaukee, Twenty Ounce,
Lady, Rhode Island Greening, Wagener,
Maiden Blush, Ridge, Walbridge,
Mann, Rome, Winesap,
May Seek-no-farther, Smith Cider, Winter Banana,
Minkler, Stark, Yellow Bellflower,
Missouri Pippin, Swaar, York Imperial.

VARIETIES ESPECIALLY LIABLE TO LOSE IN QUALITY IN GOING DOWN IN COLD STORAGE.

Most varieties lose in quality before decay sets in. The following have been particularly mentioned as doing so:

Alexander, Jonathan, Ridge,
Black Gilliflower, Keswick, Rome,
Blue Pearmain, Lady, Salome,
Boiken, Maiden Blush, Shiawassee,
Canada Baldwin, Minkler, S. T. Lawrence,
Cranberry Pippin, Northwestern Greening, Smith Cider,
Domine, Oldenburg, Stark,
Pallawater, Peck Pleasant, Swaar,
Fall Pippin, Perry Russet, Tolman Sweet,
Fall Wine, Pewaukee, Tompkins King,
Fameuse, Plumb Cider, Twenty Ounce,
Gideon, Pomme Grise, Wagener,
Grimes, Pumpkin Sweet, Walbridge,
Haas, Rambo, Wealthy,
Holland Pippin, Rhode Island Greening, Winter Banana,
Hubbardston, Ribston, Wolf River,
Yellow Bellflower.

CHANGE IN COLOR IN STORAGE.

Many varieties change in color in common storage, especially by turning from green to yellow. Holland Pippin, Swaar, Tolman Sweet and Yellow Bellflower improve in color. Apples in which the prevailing colors are shades of red and the ground color green or yellow may be brightened in color by the development of the yellow tints, which also makes the reds brighter by contrast. Thus, Cooper Market turns from its autumn color of dark red to an attractive bright red in May in cellar storage but not in chemical cold storage. (Britton.) On the other hand both greens and yellows may become pale and faded. "St. Lawrence, unless
well colored on the tree, fades in the barrel to a distinctly gray color, materially lessening its market value." (Britton.)

The following varieties are reported as either eventually liable to lose in color in storage, or to lack the improvement in color when kept in cold storage which they commonly show in cellar storage:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Variety</th>
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<tbody>
<tr>
<td>Canada Baldwin,</td>
<td>Minkler,</td>
<td>Smith Cider,</td>
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<tr>
<td>Cooper Market,</td>
<td>Missouri Pippin,</td>
<td>Wagener,</td>
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<tr>
<td>Gano,</td>
<td>Peck Pleasant,</td>
<td>Walbridge,</td>
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<tr>
<td>Grimes,</td>
<td>Rhode Island Greening,</td>
<td>Winesap,</td>
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<tr>
<td>Hubbardston,</td>
<td>Ridge,</td>
<td>Winter Banana,</td>
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<tr>
<td>Lady,</td>
<td>Rome,</td>
<td>York Imperial.</td>
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<tr>
<td>Maiden Blush,</td>
<td>St. Lawrence,</td>
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</tbody>
</table>

**VARIETIES LOSING IN FIRMNESS IN GOING DOWN IN STORAGE.**

Most varieties lose in firmness before going down in storage. The following have been particularly mentioned as having this fault:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Variety</th>
<th>Variety</th>
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</thead>
<tbody>
<tr>
<td>Black Gilliflower,</td>
<td>Hubbardston,</td>
<td>Ridge,</td>
</tr>
<tr>
<td>Blue Pearmain,</td>
<td>Jacobs Sweet,</td>
<td>Rome,</td>
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<tr>
<td>Canada Baldwin,</td>
<td>Keswick,</td>
<td>Roxbury,</td>
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<tr>
<td>Domine,</td>
<td>Lady,</td>
<td>St. Lawrence,</td>
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<tr>
<td>Esopus Spitzenburg,</td>
<td>Lady Sweet,</td>
<td>Shiawassee,</td>
</tr>
<tr>
<td>Fallwater,</td>
<td>Minkler,</td>
<td>Smith Cider,</td>
</tr>
<tr>
<td>Fall Orange,</td>
<td>Missouri Pippin,</td>
<td>Stark,</td>
</tr>
<tr>
<td>Fall Wine,</td>
<td>Peck Pleasant,</td>
<td>Wagener,</td>
</tr>
<tr>
<td>Gano,</td>
<td>Perry Russet,</td>
<td>Walbridge,</td>
</tr>
<tr>
<td>Gideon,</td>
<td>Pewaukee,</td>
<td>Wealthy,</td>
</tr>
<tr>
<td>Gravenstein,</td>
<td>Plumb Cider,</td>
<td>Winter Banana,</td>
</tr>
<tr>
<td>Grimes,</td>
<td>Pumpkin Sweet,</td>
<td>Wolf River,</td>
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<tr>
<td>Haas,</td>
<td>Rambo,</td>
<td>Yellow Bellflower.</td>
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**VARIETIES LIABLE TO BECOME BITTER IN SKIN IN GOING DOWN IN STORAGE.**

The following varieties are reported to be liable to become bitter in skin in going down in storage:

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<thead>
<tr>
<th>Variety</th>
<th>Variety</th>
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<tbody>
<tr>
<td>Alexander,</td>
<td>Lady,</td>
<td>Rome,</td>
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<tr>
<td>Baldwin,</td>
<td>Minkler,</td>
<td>St. Lawrence,</td>
</tr>
<tr>
<td>Boiken,</td>
<td>Perry Russet,</td>
<td>Smith Cider,</td>
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<tr>
<td>Cranberry Pippin,</td>
<td>Pewaukee,</td>
<td>Stark,</td>
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<tr>
<td>Esopus Spitzenburg,</td>
<td>Pomme Grise,</td>
<td>Swaar,</td>
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<tr>
<td>Gano,</td>
<td>Rails,</td>
<td>Tolman Sweet,</td>
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<tr>
<td>Gilpin,</td>
<td>Rhode Island Greening,</td>
<td>York Imperial.</td>
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<tr>
<td>Haas,</td>
<td>Ridge,</td>
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</table>
VARIETIES LIABLE TO SHRIVEL IN GOING DOWN IN STORAGE.

The varieties named below have been reported as normally liable to shrivel in going down in storage or before. Many other varieties shrivel if picked too green.

Blue Pearmain, Boiken, English Russet, Esopus Spitzenburg, Fallawater, Golden Russet, Haas, Hubbardston, Jonathan, Lady Sweet, McIntosh, Peck Pleasant, Perry Russet, Pewaukee, Pumpkin Sweet, Ralls, Rambo, Roxbury, St. Lawrence, Swaar, Tolman Sweet, Westfield Seek-no-further.

VARIETIES LIABLE TO BECOME MEALY IN GOING DOWN IN STORAGE.

Many varieties become mealy in storage but only a few enough so to hurt their value in the markets. A large Baldwin is liable to become mealy but not an average sized one. The following varieties are particularly reported as becoming mealy in going down in storage:

Baldwin, Ben Davis, Black Gilliflower, Blue Pearmain, Cranberry Pippin, Domine, Esopus Spitzenburg, Fall Orange, Fameuse, Gano, Gideon, Grimes, Haas, Hendrick, Holland Pippin, Hubbardston, Maiden Blush, Oldenburg, Perry Russet, Pewaukee, Pomme Grise, Pumpkin Sweet, Ralls, Rambo, Rhode Island Greening, Yellow Bellflower, Ridge, Rome, Roxbury, St. Lawrence, Smith Cider, Stark, Tolman Sweet, Tompkins King, Twenty Ounce, Wagener, Wealthy.

VARIETIES LIABLE TO BURST IN STORAGE BEFORE DECAYING.

Any apple that will scald is liable to burst, says Howes. A large fruit of any variety is more liable to burst than a medium sized one. The following varieties are reported as being liable to burst as the fruit goes down in storage:

Baldwin, Black Gilliflower, Domine, Fall Orange, Fameuse, Hubbardston, Maiden Blush, Oldenburg, Plumb Cider, Pomme Grise, Rhode Island Greening, Ridge, Roman Stem, St. Lawrence, Smith Cider,
Gideon, Pumpkin Sweet, Stark,
Haas, Rails, Wagener,
Hendrick, Rambo, Yellow Bellflower,
Holland Pippin,

**Suddenness of Going Down in Storage.**

The varieties named below are reported as going down gradually in storage. It will be noticed that most of the varieties in this list are late or mid-winter varieties.

Baldwin, Lawyer, Rome,
Black Gilliflower, Limbertwig, Roxbury,
Blue Pearmain, Maiden Blush, Solome,
Boiken, Mann, Shiawassee,
Canada Baldwin, Minkler, Smith Cider,
Cooper Market, Missouri Pippin, Stark,
Cranberry Pippin, Northwestern Greening, Sutton,
Domine, Peck Pleasant, Swaar,
English Russet, Pewaukee, Tolman Sweet,
Fallwater, Pomme Grise, Tompkins King,
Gano, Rails, Walbridge,
Gilpin, Rambo, Winesap,
Grimes, Red Canada, Winter Banana,
Hendrick, Rhode Island Greening, Yellow Bellflower,
Jonathan, Ridge, Yellow Newtown,
Lady Sweet, Roman Stem,

The varieties in the following list are reported as going down quickly. It will be noticed that they are nearly all fall or early winter varieties. In general, the earlier the season of the variety the more rapidly does it go down after final deterioration has set in. Some of these varieties are named also in the preceding list of varieties that go down gradually. This repetition simply expresses the differing experiences or judgments of different correspondents.

Alexander, Haas, Pumpkin Sweet,
Bailey, Holland Pippin, Rambo,
Black Gilliflower, Hubbardston, Ribston,
Domine, Jacobs Sweet, Ridge,
Esopus Spitzenburg, Keswick, St. Lawrence,
Fall Orange, Lady, Tompkins King,
Fall Pippin, Maiden Blush, Twenty Ounce,
Fall Wine, Northern Spy, Wagener,
Fameuse, Oldenburg, Wealthy,
Gideon, Perry Russet, Wolf River,
Golden Russet,  
Gravenstein,  
Grimes,  

Pewaukee,  
Plumb Cider,  
Pomme Grise,  

Yellow Bellflower,  
York Imperial.

ENDURANCE OF HEAT BY DIFFERENT VARIETIES AFTER HAVING BEEN PICKED AND BEFORE GOING INTO STORAGE.

Varieties differ greatly in endurance of heat after having been picked and before going into storage. Summer and early fall varieties are most affected in this respect and late-keeping varieties least. In order to keep longest in cold storage apples should be exposed to heat for as short a time as possible after having been picked.

Varieties listed below are reported as standing heat comparatively well before going into storage. Those which stand heat best are among the latest.

Baldwin,  
Ben Davis,  
Black Gilliflower,  
Blue Pearmain,  
Boiken,  
Canada Baldwin,  
Cooper Market,  
Cranberry Pippin,  
Domine,  
English Russet,  
Esopus Spitzenburg,  
Fallawater,  
Fameuse,  
Gano,  
Gilpin,  
Golden Russet,  

Green Newtown,  
Hendrick,  
Jonathan,  
Lady Sweet,  
Lawver,  
Limbertwig,  
Mann,  
Minkler,  
Missouri Pippin,  
Ontario,  
Plumb Cider,  
Pomme Grise,  
Pumpkin Sweet,  
Rails,  
Rambo,  

Red Canada,  
Roman Stem,  
Rome,  
Roxbury,  
Salome,  
Smith Cider,  
Stark,  
Sutton,  
Swaar,  
Tolman Sweet,  
Tompkins King,  
Walbridge,  
Westfield Seek-no-further,  
Winesap,  
Winter Banana.

In the next list are shown the varieties which are reported as being much affected by heat. This list includes all the summer and early fall apples concerning which reports on this point were made, and most of the late fall and early winter apples. But some winter apples are also comparatively sensitive to heat, as Rhode Island Greening and Northern Spy. In the case of some varieties heat induces scald or sweat spot.

Alexander,  
Bailey,  
Blenheim,  
Fall Orange,  

Jacobs Sweet,  
Keswick,  
Lady,  
Maiden Blush,  

Ribston,  
Ridge,  
St. Lawrence,  
Shiawassee,
NOTES ON VARIETIES.

In preparing these notes on varieties the plan has been to give in one paragraph the results of the tests of the keeping quality of apples in the natural temperature storage at this Station made in the seasons of 1895–6 to 1898–9, inclusive; in the next paragraph are the results of the tests of the keeping qualities of varieties grown at this Station, made in a cold storage warehouse in Buffalo by the United States Department of Agriculture; and in the last paragraph is a summary of the experience of cold storage men with the respective varieties. In some cases a general estimate of the variety for storage purposes is made in a preliminary paragraph.

Referring to results obtained at this Station, the term "Commercial limit," means, unless otherwise specified, the time to which dealers may safely hold a given variety in natural temperature warehouses under conditions similar to those which obtained in these tests. Referring to results of tests in cold storage, the term means similarly the time to which the variety may be held in such storage.

In the notes on tests at the Station are given the seasons in which each variety was tested, the number of fruits stored, their average life for all seasons tested and the mean date of deterioration of last fruits of the variety. These results, as already stated, are obtained with fruit grown in the Station orchards and may not apply exactly to fruit from other localities.

Admirable (Small Admirable). In the Station tests fruit was stored in 1895, '96, '97 and '98. The mean dates were Sept. 27 for storing; Jan. 1 for average life; May 4 when last apples went out. The crop of 1897 kept much the best, otherwise results were fairly uniform indicating that under the existing conditions the season for this variety is November and December.
Alexander (Wolf River incorrectly). This is an early fall apple and is not often put into storage.
In Station tests 60 apples were stored Sept. 9, 1897. The average life extended to Nov. 4, the last fruit being thrown out Jan. 12.
In the experience of storage men its season in cellar storage is until October and in chemical cold storage until November. It goes down quickly and does not stand heat well before going into storage. It should be shipped the day it is picked and under ice.

American Blush (of some; see Hubbardston).

American Blush. Hart reports that this variety as disseminated by C. A. Green of Rochester is entirely distinct from Hubbardston. Season about the same as Baldwin. It is a little inclined to scald. See note on Hubbardston.

Amos (Amos Jackson). In the Department cold storage tests small, hard and green fruit from this Station, stored Sept. 27, was still firm and free from scald or rot May 1.

Amos Jackson (see Amos).

Andrews (Andrews Winter). In the Station tests fruit from the crops of 1895, '96 and '97 was stored. The average number tested was 83. The mean dates were Oct. 19 for storing; June 8 for average life; Aug. 16 when the last apples went out. The results were pretty uniform indicating that the season may extend to the middle of May or sometimes into June. With two crops a considerable portion of the fruit remained sound till the middle of June.

Andrews Winter (see Andrews).

Arkansas (Blacktwig, Mammoth Blacktwig). In the Station tests this fruit was stored Oct. 14, 1897; average life extended to Apr. 12; last fruit went out June 30.

Aucuba (Aucuba-leaf Reinette). In the Station tests fruit borne in 1895, '96, and '97 was stored. The mean dates were Sept. 25 for storing, Jan. 8 for average life and May 5 when last fruit went out. Results were fairly uniform, indicating that the season extends to December or possibly to January.
In the Department cold storage tests bright, well-colored fruit from this Station, stored Oct. 21, kept sound and in good condition until Feb. 1.

Aucuba-leaf Reinette (see Aucuba).

Aunt Ginnie (see Ginnie).

Bailey (Bailey Sweet). A poor keeper and does not stand heat well.

Baker (Scott). In the Department cold storage tests hard, greenish fruit from this Station, stored Sept. 29, kept firm and sound in cold storage until Mch. 14, after which it softened.

Baldwin. A leading variety for cold storage purposes, ranking in season between Rhode Island Greening and Ben Davis.
In the Station tests fruit of 1895, '96, '97 and '98 was stored. The mean dates were Oct. 13 for storing; May 10 for average life; June 29 when last fruits went out. Results variable but indicate that under the con-
ditions of the tests the season may extend through April. With two crops a considerable portion of the fruit remained sound till early June.

In the Department cold storage tests hard, light-colored, small fruit from this Station, stored Oct. 15, was still hard and sound May 1.

According to storage men its season in cellar storage is until March or April, varying from Feb. 15 in unfavorable seasons (Fenton) to June 1 in favorable seasons (Payne). Season in chemical cold storage until May or June. Graham states that the fruit will hold until June if well colored on the tree, but only until April if colored on the ground. It goes down gradually with some liability to scald late in the season, Phillips Bros. specifying March and later in common storage and Graham May 1 and later in chemical cold storage “unless stored immediately after picking.” Wilson says Baldwin is less liable to scald if picked as soon as the plump seeds are black than if left on the tree until it gets its full color. Moreover in the latter case much of the crop would be lost besides putting off picking until very late in the fall. Beckwith remarks that a gray Baldwin grown on the heavy soil of the Lake Ontario shore keeps longer than any other Baldwin. The higher-colored Baldwins grown on sandy or gravelly land are said to scald earlier. Large specimens are liable to become mealy (Howes) and scald and burst (Wilson, Morgan) but those of medium size only rarely.

**Barbel (Sugar Barbel).** In the Station tests fruits from the crops of 1895 and '96 were tested, the average number under observation each season being 77. The mean date of storing was Oct. 1, of average life Feb. 7 and of decay of last fruits June 12. Decay began in November and proceeded gradually through the season.

*Belle de Boskoop* (see Boskoop).

*Bellflower* (see Yellow Bellflower).

**Ben Davis.** This variety holds well in any storage and its value for storage purposes is enhanced by the facts that it retains its fine appearance and stands handling well after coming out of storage. New York-grown Ben Davis hold considerably later in the season than do Ben Davis from warmer latitudes.

In the Station tests fruit grown in 1895, '96, '97 and '98 was stored. The mean dates were Oct. 20 for storing; May 29 for average life; Aug. 3 when last apples went out. The results were quite uniform indicating that the season may extend into May.

In the Department cold storage tests hard, small, light-colored fruit from this Station, stored Nov. 12, was still semifirm and free from scald and decay May 1.

Storage men report its season in common storage as extending to April and in chemical cold storage until July 1. It stands heat fairly well before going into storage and goes down slowly, becoming mealy and scalding slightly at the last, according to some correspondents. Fenton reports that it shrivels late in the season in common storage. Graham remarks, “Some persons claim this variety should be held at 31° but we have had best results at 32°.”
In the Department cold storage tests fruit from this Station, stored Sept. 27, was firm and free from decay May 1 but slightly scalded. Commercial limit Apr. 1.

**Blenheim** (*Blenheim Pippin, Blenheim Orange*). “Earlier than Hubbardston or Tompkins King. Heat ripens it quickly but in a moderately cool season it ranks high in its class as a shipper.” (Shuttleworth.)

In the Station tests apples grown in 1896 and '97 were stored. The average number tested was 52. The mean dates were Oct. 7 for storing; Jan. 21 for average life; and June 12 when the last fruit went out. Season early winter extending possibly as late as middle of January.

**Black Gilliflower** (*Gilliflower*). Storage men report its season in cellar storage as extending to Feb. 1 (Howes, Graham) or April (Payne) and in chemical cold storage until Mch. 1. It stands heat before going into storage quite well. After having become decidedly mealy it goes down slowly according to some, while others say quickly. Howes adds that it loses in quality and firmness and often bursts.

**Blacktwig** (see **Arkansas**).

**Blue Pearmain** (*Prolific Beauty* incorrectly). Keeps in cold storage about with Rhode Island *Greening*. It is an old variety but not much grown in this State except in the northern counties.

Newhall gives its season in cellar storage as February, and in chemical cold storage as May, while Graham gives these dates as Nov. 20 and Dec. 15, respectively. It stands heat fairly well, and goes down in storage gradually after having lost in firmness. Newhall states that it also loses in quality and becomes mealy but does not shrivel, all of which is contrary to the experience of Graham and others.

**Boiken**. Storage men report its season in cellar storage as extending until February and in chemical cold storage until May. It stands heat before going into storage very well. It goes down gradually, losing in quality, the skin becoming bitter and the fruit shriveling.

**Borsdorf**. German name **Borsdorfer**. In the Station tests 104 apples were stored Oct. 9, 1897. The average life extended to Feb. 28 and the last fruit went out June 11.

In the Department cold storage tests fruit from this Station, stored Sept. 27, was soft and badly decayed Mch. 14.

**Boskoop** (*Belle de Boskoop*). In the Station tests, Sept. 20, 1895, 50 apples and Sept. 30, 1896, 40 apples went into storage. The mean date for the average life was Nov. 17 and the mean date when the last apples went out was Jan. 20 indicating that the season extends into October or under favorable conditions into November. It sometimes keeps till April.

**Brownlee** (*Brownlee Russet*). In the Station tests fruit was stored in 1896 and '97. The mean dates were Oct. 19 for storing; Feb. 19 for average life; and June 9 when last fruit went out. The results indicate that the season extends into January or possibly into February.

**Buckingham**. In the Station tests 104 apples were stored Oct. 5, 1896. The average life extended to Mch. 9 and the last fruit went out Jul. 12.
Cabashea (Cabashaw; Twenty Ounce Pippin of some). A large coarse apple, season of Tompkins King.

Canada Baldwin. Ranks about with the New York Baldwin in keeping quality.

In the Station tests apples of the crops of 1896 and '97 were stored. The mean dates were Oct. 8 for storing; Mch. 14 for average life; and June 3 when last fruit went out. The results were very similar in both years indicating that the season may extend through February.

Storage men report its season as extending in cellar storage to March and in chemical cold storage to May. It stands heat comparatively well before going into storage and goes down gradually after having scalded and lost in quality and color and having softened.

Canada Pippin (see White Pippin).

Canada Red (see Red Canada).

Canada Reinette. At the Station, fruit of the seasons of 1896 and '97 was tested. The mean dates were Oct. 20 for storing; Mch. 17 for average life; and June 27 when last fruits went out. The figures for the two seasons vary greatly but indicate that under favorable conditions the fruit may be held until March.

In the Department cold storage tests this variety from this Station stored Oct. 19, was mellow and free from decay, but slightly scalded May 1. Best commercial limit Apr. 1.

Caux (Reinette de Caux). At the Station, fruit of the seasons of 1896, '97 and '98 was tested. The mean dates were Oct. 17 for storing; Apr. 8 for average life; and June 24 when last fruits went out. Averages for the different years differ greatly. The average life in 1896 and '97 extended only till about the middle of March while in '98 it extended till the latter part of May. The indications are that this variety usually may be held till March.

Cayuga Red Streak (see Twenty Ounce).

Celestia. In the Station tests 61 apples were stored Oct. 1, 1896, and 104 apples Oct. 8, 1897. The mean date for average life was Feb. 25 and for the discarding of the last fruit was June 3. There was much difference in the keeping quality of the fruit in these two years, indicating that its season may vary greatly. It may be expected to extend into January; it may possibly extend through the winter.

Chase (Western Beauty of our previous records and of U. S. Dept. Agr., B. P. I. Bull. 48). Apparently well adapted for holding in cold storage.

In the Station tests 66 apples were stored Oct. 17, 1896, and 102 apples Oct. 15, 1897. The mean dates were May 4 for average life, and July 28 when last fruit went out. The year 1896 was decidedly unfavorable to the development of good keeping quality in apples. For the crop of 1896 the average life extended only till Mch. 22, but for that of 1897 it extended to June 15. Ordinarily the fruit may be expected to keep till March or later.
In the Department cold storage tests this variety from this Station, stored Oct. 21, was firm and free from rot or scald May 1.

Chenango (Chenango Strawberry, Sherwood Favorite). In the Station tests 105 apples were stored Sept. 2, 1896. The average life extended to Nov. 8. This variety ripens unevenly on the tree and therefore two or more pickings should be made of fruit intended for storing. The latest ripening fruit may be kept till November. After that it deteriorates much in quality even when the fruit is apparently sound.

Christmas Apple (see Lady).

Clarke. In the Station tests 30 apples were stored Oct. 5, 1896, and 105 apples Oct. 9, 1897. The mean dates were Feb. 2 for average life, and Apr. 11 when the last fruit went out.

In the Department cold storage tests this variety from this Station, stored Oct. 21, was mellow and free from scald but slightly decayed Feb. 1; commercial limit Dec. 1. Flesh grows soft and mealy and discolors at end of commercial life.

Codlin (see Keswick).

Cogswell. In the Station tests 48 apples were stored Oct. 1, 1896. The average life extended to Feb. 22. The last apples went out June 30. About 20 per ct. of the fruit went out during the first month of storage. The remainder kept well till the first of February after which it went out gradually.

In the Department cold storage tests this variety from this Station stored Oct. 11, was firm and free from scald and decay May 1.

Coon (Coon Red). Fruit attractive bright red. Apparently well adapted for storage.

In the Station tests fruit from the crops of 1896, '97 and '98 was stored. An average of 84 specimens was put under test. The mean dates were Oct. 10 for storing; Mch. 26 for average life; and June 9 when the last fruit went out. The results were pretty uniform. The fruit kept till about Mch. 1 with comparatively little loss, after which it went down gradually.

In the Department cold storage tests this variety from this Station stored Sept. 28 was semifirm and free from decay, but slightly scalded May 1. Commercial limit Mch. 15.

Cooper Market. This is one of the latest-keeping varieties grown but is otherwise valuable principally on account of its productiveness and bright color late in the season. Some consider this one of the best commercial kinds to supply the trade after the Baldwin season.

In the Station tests apples of the crops of 1895, '96 and '97 were stored. The mean dates were Oct. 20 for storing, May 2 for average life and Aug. 6 when last fruit went out. Comparatively little fruit went out before the middle of May after which it went down pretty rapidly although in one instance some specimens were kept till the first of September. The results were pretty uniform and in conformity with the known late keeping qualities of this variety.
In the Department cold storage tests this variety from this Station, stored Oct. 21, was still hard and sound May 1.

Cold storage men report its season in cellar storage variously as extending to Apr. 1 or July 1 and in chemical cold storage to May 1, July 1 or the year around.

It stands heat before going into storage as well as any variety and goes down gradually without developing any undesirable qualities unless scald. Britton remarks, "No other variety I have ever seen improves so much in color while in the barrel as Cooper Market." Its natural color as picked is dark red but in common storage it takes on a bright red in May. In cold storage this change does not take place but the fruit remains dark red.

*Cox Pomona* (see *Pomona*).

**Cranberry Pippin.** This variety as grown in western New York sometimes keeps through the winter but ranks rather below Baldwin in keeping quality. As grown in the Hudson Valley its season is one month to six weeks earlier than Hubbardston and Tompkins King.

Season in cellar storage until December or January and in chemical cold storage until April. It stands heat fairly well before going into storage and goes down gradually after having lost in quality, softened, become mealy and the skin having become bitter.

*Crottis.* In the Station tests 104 apples were stored Oct. 16, 1897. The average life extended to Jan. 28 and the last fruit was discarded June 30. It kept well till the first of February and then went down pretty rapidly till the last of March, after which the remaining fruit went out gradually.

In the Department cold storage tests fruit from this Station, stored Oct. 21, was firm and free from decay Mch. 14, but badly scalded.

*Deacon Jones.* In the Department cold storage tests fruit grown at this Station, stored Oct. 11, was mellow but free from rot and scald May 1. Commercial limit for barrel storage about Mch. 1.

**Dickinson.** This variety appears to be quite variable in keeping quality.

In the Station tests fruit from the crops of 1895, '96 and '97 was stored. The mean dates were Oct. 8 for storing; Feb. 27 for average life; and June 11 when the last fruit when out. The fruit of 1895 and '96 showed a rather high rate of loss from the middle of November throughout the winter; but the fruit of 1897 showed but small percentage of loss before the first of February. Through February, March and April it went out rather slowly and after that went down rapidly. It appears that ordinarily it would be best not to hold it much later than the first of January.

In the Department cold storage tests bright, No. 1 fruit from this Station, stored Sept. 27, was overripe and badly decayed May 1. Commercial limit in 1901-2, Mch. 1; in 1902-3, Feb. 1.

**Disharoon.** In the Station tests 50 specimens were put in storage Sept. 17, 1896, and 69 specimens Sept. 29, 1897. The mean dates were Sept. 23 for storing; Jan. 11 for average life; and May 12 when last fruit
was discarded. The results were similar in both years. There was a gradual loss of fruit from November till the close of the season. For commercial purposes it appears that the fruit should not be kept later than December.

In the Department cold storage tests, sound, No. 1 fruit from this Station, stored Sept. 27, was sound and free from scald and decay Apr. 1 but beginning to turn mellow.

**Domine (English Redstreak, Wells).** In the Station tests fruit grown in '86 and '97 was tested. The mean dates were Oct. 13 for storing; Mch. 13 for average life; and June 8 when last apples went out. The results of both tests were similar. The fruit kept till February with but small loss. After the middle of February it went down more rapidly, indicating that here its commercial season would not extend beyond February.

Two reports were received from storage men on this variety and they are widely at variance with each other. Graham reports that it stores very well; season in cellar storage Feb. 1, and in chemical cold storage Mch. 1. Newhall reports that it is inferior to Hubbardston in keeping quality, seasons October and January in the respective storages. Graham reports that it stands heat before going into storage very well and goes down in storage gradually without having previously lost in quality, become soft or mealy or having burst, all of which is contrary to Newhall's experience. Tests of the keeping quality of this fruit at this Station rather agree with Graham's experience, for its average life extended to Mch. 9 and 16 respectively, two seasons.

**Duke of Devonshire.** In the Station tests fruit was stored from the crops of '96 and '98. The mean dates were Oct. 1 for storing; Mch. 5 for average life; and May 1 when last fruit went out. The results of both tests were similar. The fruit kept well till about the first of February and then went out rapidly, although a few straggling specimens remained till March and in one instance till June. The commercial limit appears to be about Feb. 1.

**Dumelow (Wellington).** In the Station tests 107 specimens were stored Oct. 23, 1896. The average life extended to Mch. 13 and the last fruit was discarded Jul. 12. By the middle of February about 25 per ct. of the fruit had gone out. About 35 per ct. remained till after the first of May.

**Duncan.** In the Station tests fruit from the crops of 1895, '96 and '97 was stored. The mean dates were Oct. 17 for storing; Apr. 13 for average life; and Jul. 4 when the last apples went out. The crop of 1895 did not keep well. But that of 1896 and '97 sustained the reputation of this variety for excellent keeping qualities. In these years the rate of loss was low till the first of May after which the fruit went out rather fast. Thirty-five per ct. of the crop of 1895 was gone by Jan. 1, yet 37 per ct. of it remained sound till the first of April. It appears that the commercial limit would ordinarily extend till the first of May.

*Edgar Red Streak* (see *Walbridge*).
Edwards. In the Station tests fruit from the crops of 1895, '96 and '97 was stored. The mean dates were Oct. 19 for storing; May 19 for average life; and Aug. 24 when the last fruit went out. Previous to the first of May the rate of loss was low. After that it rose rapidly. Some specimens may often be kept till apples come again.

In the Department cold storage tests hard, green fruit from this Station, stored Sept. 27, was quite mellow but free from scald or rot Mch. 14.

Elgin (Elgin Pippin). In the Station tests apples from the crops of 1896 and '97 were stored. The mean dates were Sept. 8 for storing; Nov. 18 for average life; and Jan. 26 when last fruit went out. Both tests gave similar results. The commercial season evidently closes before November.

English Pippin. In the Station tests 105 apples went into storage Sept. 1, 1896. The average life extended to Nov. 3 and the last fruit went out Jan. 12. Commercial limit October.

English Russet (Golden Russet incorrectly). This is one of the longest keeping apples grown commercially.

Season in cellar storage April and in chemical cold storage June to July. It stands heat before going into storage extra well, and goes down very slowly after having shriveled. Newhall reports on a fall apple under this name which may be the English Russet of Warder.

Esopus Spitzenburg (Spitzenburg). Ranks between Rhode Island Greening and Baldwin as a keeper. It is quite variable in keeping quality in different seasons and different localities.

In the Station tests apples from all four crops were stored. The average number that went into storage was 128. The mean dates were Oct. 11 for storing; Mch. 21 for average life; and June 19 when last fruit went out. The crop of '95 kept exceptionally poorly while that of '98 kept exceptionally well. The commercial limit varied with the different seasons from January to April.

In the Department cold storage tests, No. 1 fruit from this Station, stored Oct. 27, was semifirm and free from decay and scald May 1. In barrels should be sold Apr. 1.

Cold storage men report its season as extending in cellar storage until February and in chemical cold storage until March (Graham). Some report it as going down quickly in storage after having become soft, shriveled and sometimes mealy and the skin bitter, all of which is contrary to the experience of other correspondents.

Etowah. In the Station tests 105 apples went into storage Oct. 8, 1897. The average life extended to Feb. 22, and the last fruit went out June 3. After the first of December there was a low rate of loss till the first of March when the fruit went out very rapidly.

Ewalt. In the Station tests 51 specimens were put in storage Sept. 30, 1896, and Oct. 11, 1897, 102 specimens. The mean dates were Apr. 10 for average life and Jul. 6 when last fruit was discarded. For the crop of 1897 the rate of loss was low and gradual from the last of November till the middle of May after which the fruit went out very rapidly. The commercial limit appears to vary from the first of March to the first of May.
In the Department tests well-colored, No. 1 fruit from this Station, stored Oct. 11, was beginning to mellow Mch. 14 with slight decay but no scald. Commercial limit in barrels Feb. 1.

**Falix.** In the Station tests 86 specimens were put into storage Oct. 14, 1897. The average life extended to Feb. 17, and the last fruit was discarded June 11. From the middle of November till the middle of March the rate of loss was pretty uniform and rather high, indicating that it would not be well to hold this variety much later than the first of January.

**Fallawater (Tulpehocken).** Ranks sometimes with Hubbardston and sometimes with Rhode Island Greening in keeping quality. It is quite variable in this respect.

In the Station tests fruit of all four crops was tested. Average number under test 84. The mean dates were Oct. 12 for storing; Apr. 26 for average life; and Jul. 15 when last fruit was discarded. Occasionally the fruit keeps pretty well through the winter with but little loss as did the crop of 1897. But as a rule there is a continuous loss at a rather low rate from about the middle of November to the middle or last of March after which the fruit goes out very rapidly as was the case with the crops of 1895 and '96.

In the Department cold storage tests, No. 1, but very green, fruit from this Station, stored Oct. 21, was semifirm, and free from decay or scald May 1.

According to cold storage men its season in cellar storage extends to January or to Mch. 1 and in chemical cold storage to Apr. 1 or May. It stands heat quite well before going into storage and goes down gradually after having scalded, softened and shriveled according to some correspondents but not in Graham's experience.

**Fall Orange.** This is an early fall variety and should not be put into storage. Cars should be iced. In cellar storage specimens are sometimes kept in quite good condition until mid-winter.

**Fall Pippin.** This is a fall variety and should not go into storage.

At the Station this variety was under observation all four seasons. The mean date of storing was Sept. 25; of average life Feb. 13; and of going out of last specimens May 3. The crop does not ripen uniformly. Some of the fruit is ripe, well-colored and ready for immediate use in September while at the same time a considerable portion of the crop is still hard and green. In these tests, of course, the early-matured fruit was not stored. With that which was stored the results were quite variable in the different seasons. The highest loss before Dec. 1 was 21 per ct. With different crops from 22 per ct. to 46 per ct. went down before Feb. 1. Even carefully selected fruit cannot be relied upon to hold to Dec. 1 without considerable loss.

In the Department cold storage tests bright, No. 1 fruit from this Station, stored Sept. 29, 1902, had commenced to soften Jan. 27. Fruit picked in 1901 kept in good condition until Jan 10. May be held in boxes until Feb. 1.

Season in cellar storage is given by storage men as September to October
and in chemical cold storage as October and November. It goes down quickly. Cars should be iced.

**Fall Queen** (see *Haas*).

**Fall Wine** (*Autumn Strawberry*). This is a fall variety and should be handled direct to the consumer.

In the Station tests fruit of the crops of 1895, '96 and '97 was put in storage. The mean date of storing was Sept. 18; of average life Feb. 23; and of discarding the last specimen June 7. With the crop of 1895 the average life extended only till Jan. 4, but in the case of the crop of '97 till Apr. 4. The fruit usually kept well through October but in one case did not. There was always a heavy loss in November and with one exception in December also, after which it was less but constant till the end. Commercial season September and October.

**Fameuse** (*Snow*). This is a fall and early winter apple, but some report that it will keep in cold dry storage, if free from scab, as long as Rhode Island *Greening*.

At the Station, fruit of the crops of 1895 and '96 was under observation. The mean date of storing was Oct. 3, of average life of the fruit Jan. 28, and of decay of the last specimen Apr. 29; but there was a great difference in the keeping quality of the fruit in the two seasons, the average life of the crop of 1896 being three months longer than the crop of 1895, according to our records. The larger part of the fruit of 1895 decayed before Jan. 1, but the crop of 1896 kept fairly well till the middle of January then went down more rapidly. In both cases there was considerable loss in November.

Commercial season November.

In the Department cold storage tests, hard, bright, No. 1 fruit from this Station, stored Oct. 21, was mellow, but free from decay or scald Jan. 31. It was still sound though very ripe Mch. 14.

Cold storage men report that it stands heat very well before going into storage and that it goes down gradually, not scalding until late but becoming mealy and bursting.

**Parris.** Fruit grown in 1895 and '96 was tested at the Station. For 1895 the average life of the fruit was Feb. 7, and the last specimens were thrown out May 28. For 1896, however, the average life was May 1, and the last specimens were not thrown out till June 30. In 1895 decay began early in the fall and proceeded moderately through the year. With the crop of 1896 it set in in January and proceeded very moderately till April, when it proceeded very rapidly. The season for this variety appears to be variable but may extend to February or March.

**Fishkill.** In the Department cold storage tests, large, sound, well-colored fruit from this Station, stored Oct. 11, began to decay internally, while still firm outside, after Jan. 1 or 15.

**Flory.** Observations were made at the Station on the crops of 1895, '96 and '97. The average date of storing was Sept 30, of life of the fruit Feb. 13, and of decay of the last specimens Jul. 18. The averages for all the years are quite uniform. Its season may be said to extend to February.
The fruit goes down very slowly at first but rather rapidly toward the latter part of the season.

**Gano.** This variety is reported by storage men to be practically identical with Ben Davis so far as keeping qualities in storage are concerned.

In the Department cold storage tests, small, hard, half-colored fruit from this Station, stored Oct. 1, was semifirm but somewhat decayed May 1. Commercial limit Apr. 1.

Newhall reports its season in cellar storage as extending until January and in chemical cold storage until May. It stands heat well before going into storage and goes down gradually. It scalds, loses in color and firmness in deteriorating, becomes mealy and the skin sometimes becomes bitter.

*Genet* (see *Ralls*).

**Gideon (Gideon White).** Inferior to Hubbardston in keeping quality. After this variety reaches maturity the flesh characteristically begins to discolor at the core.

Observations were made at the Station on the crops of 1895, '96 and '97. The mean date of storing was Sept. 17; of average life Jan. 11; and of decay of last specimens May 13. This variety differed widely in keeping quality in the different seasons. In season October to December but may sometimes keep till February. The variety usually goes down rather moderately.

Storage men report its season as extending in cellar storage to October or November and in chemical cold storage until November to February. They report that it stands heat poorly before going into storage and that it goes down quickly after having lost in quality, softened, become mealy and having burst.

**Gideon Sweet.** Fruit stored Oct. 5, 1896, at the Station, showed an average life extending to May 1, the last fruits being thrown out Jul. 12. The fruit went down gradually.

*Gillicflower (see Black Gillicflower).*

**Gilpin (Little Red Romanite).** "A very late keeper, keeping well in any kind of storage. Some bury it in the ground like potatoes and take it out in the spring." (Graham.)

**Ginnie (Aunt Ginnie).** Fruit of the crops of 1895, '96 and '97 was tested at the Station. The average number of specimens under test was 68. The mean dates were Sept. 24 for storing; Dec. 28 for average life; and May 11 when last fruit went out. There was a high rate of loss during October, November and December, after which the apples then remaining went out gradually. Commercial season September to November.

**Golden Medal.** Fruit of the crops of 1896 and '97 was tested at the Station. The mean dates were Oct. 8 for storing; Mch. 24 for average life; and Jul. 22 for discarding the last specimens. The crop of 1896 showed a high percentage of loss in November and December, after which it went out gradually. But the crop of 1897 did not show a high rate of loss before the middle of May. It then went down rapidly.
Golden Russet (of Western-New York). This variety was formerly much sought after for the latest use; but since the introduction of cold storage and of highly-colored late keeping varieties such as Ben Davis, its value has been much lessened.

Fruit from all of our crops was tested at the Station. The average number of apples stored was 165. The mean dates were Oct. 15 for storing; Mch. 23 for average life; and Jul. 2 for discarding the last fruit. The results were variable with the different tests. The crops of 1895 and '98 lost a comparatively high percentage of fruit before the first of January after which the rate of loss was low till May when it again became high. The crops of 1896 and '97 on the contrary, showed a comparatively low rate of loss through the winter and in one case kept remarkably well till after the first of May.

In the Department cold storage tests hard, greenish russet, No. 1 fruit from this Station, stored Nov. 15, was in prime commercial condition and free from decay May 1. June 1, the fruit was mellow and decay was setting in.

Storage men report its season as extending in cellar storage variously to Mch. 1, or to June and in chemical cold storage to May or to August. It stands heat very well before going into storage according to most of our correspondents. It is said to shrivel and go down quickly when once decay has begun. Wilson remarks that the less the russetting, the shorter lived the fruit.

Gracie. Sept. 1, 1896, 99 apples were put in storage at the Station. The average life extended to Oct. 6 and the last fruits went out Nov. 14, indicating September as the commercial season for this variety.

Gravenstein. A fall and early winter apple, inferior in keeping quality to Hubbardston. But taking it in its class it stands up well in good dry cold storage.

Aug. 31, 1896, 104 apples were put in storage at the Station. The average life extended to Dec. 6. The last apples went out Apr. 6. There was a high rate of loss up to the first week in December, a low rate of loss from that time till the first week in February after which the loss again became high. Commercial season September to November. A considerable percentage of the fruit remains sound much later than this but such fruit loses very much of its original flavor, quality and bright color.

In the Department cold storage tests No. 1, highly-colored fruit from this Station, stored Sept. 27, reached its commercial limit Dec. 1, after which it softened but showed no scald.

Storage men report its season as extending in cellar storage to October or to December and in chemical storage variously until November or February. It is said to stand heat before going into storage as well as any variety of its season but cars should be iced. Some say it goes down gradually, some say quickly.

Greasy Pippin (see Lowell).

Greening (see Rhode Island Greening)
Green Newtown (Green Newtown Pippin, Newtown Pippin). A late keeper, coming into its prime in March.

In the Station tests apples of the crops of 1896 and '97 were stored. The mean dates were Oct. 21 for storing; June 1 for average life; and Jul. 28 when the last fruit went out. The results were quite uniform for both tests. There was no loss till toward spring and the rate of loss did not rise very high before May. On the first of May there remained 65 per ct. of sound fruit in one case and in the other over 75 per ct.

In the Department cold storage tests, No. 1 fruit from this Station, stored Oct. 21, was too green for use in March; May 1 it was still hard and free from decay but slightly scalded.

Storage men doubtless sometimes fail to distinguish between this and the Yellow Newtown for they report its season in cellar storage as extending variously until December or February and in chemical cold storage until March or April. The true Green Newtown keeps longer than the Yellow Newtown. It is reported to stand heat well before going into storage and to go down gradually with liability to scald.

Greenville (Downing Winter Maiden Blush). At the Station, apples from the crops of 1895, '96 and '97 were tested. The average number under test was 78. The mean dates were Oct. 3 for storing; for average life Feb. 19; and for discarding last fruit May 19. There is a moderate rate of loss through the early part of the winter. About the first of February the rate of loss begins to increase quite rapidly. Apparently the commercial limit is January.

In the Department cold storage tests, large, finely colored, No. 1 fruit from this Station, stored Oct. 21, was in excellent commercial condition till Feb. 1 when scald began to develop. The fruit was one-third scalded Mch. 14.

Grimes (Grimes Golden). Rank about with Hubbardston as a keeper.

At the Station apples from the crops of 1895, '96 and '97 were stored. The average number tested was 80. The mean dates were Oct. 6 for storing; Feb. 23 for average life; and May 25 when the last fruit went out. The rate of loss was high in November, low in December and January and high through the remainder of the season, except that the crop of '97 showed only a very low rate of loss before the first of February. Commercial season extends to December or January.

In the Department tests, No. 1, fairly well-colored fruit from this Station, stored Oct. 11, was in good condition commercially till Feb. 1 when scald began to develop. May 1, all the fruit was scalded but was still semifirm.

Storage men report its season in cellar storage as extending variously to November or January and in chemical storage to January or February. The fruit should be kept cool before going into storage. In deteriorating it is liable to scald, lose in quality, color and firmness and according to Newhall, to shrivel and become mealy. It goes down quickly.

Haas (Fall Queen). This variety should not go into storage ordinarily.

At the Station fruit of all four crops was tested. The average number
put under test was 86. The mean dates were Sept. 27 for storing; Dec. 16 for average life; and Mch. 15 when the last apples went out. The results were pretty uniform showing that the commercial limit is November or possibly in some seasons December.

In the Department cold storage tests fairly well-colored, No. 1 fruit from this Station was stored Sept. 27. After Dec. 1 the flesh began to mellow, grow mealy and decay.

Storage men report its season as extending in cellar storage to November or December and in chemical storage to Jan. 15. It does not stand heat well before going into storage and the cars should be iced. It goes down gradually.

**Haskell (Haskell Sweet).** In the Station tests Sept. 21, 1895, 49 apples and Sept. 8, 1896, 105 apples were stored. The average life extended to Nov. 28. The mean date for throwing out the last fruit was Feb. 21. The results were uniform for both tests and indicate that the commercial limit is early November for this variety.

In the Department cold storage tests the commercial limit of No. 1 fruit from this Station, stored Oct. 21, was Jan. 15, after which the fruit began to soften. There was no scald.

**Heidorn.** In the Station tests 30 apples were stored Sept. 30, 1897. The average life extended to Dec. 5. The last fruit went out Jan. 12.

**Hendrick (Hendrick Sweet; Bailey Sweet incorrectly).** Storage men report the season of this variety as extending in cellar storage to Apr. 1, and in chemical cold storage to May 15. It stands heat well before going into storage and goes down gradually, becoming mealy and bursting.

**Henniker (Lady Henniker).** In the Station tests 104 apples were stored Sept. 16, 1896. The average life extended to Jan. 28. The last fruit went out June 8.

In the Department cold storage tests well-colored, No. 1 fruit from this Station was stored Sept. 27. After Dec. 1 the flesh began to mellow. There was no scald.

**Holland Pippin (of Downing and of Eastern New York; Fall Pippin incorrectly).**

Resembles Fall Pippin closely but begins to ripen earlier. Season in cellar storage according to storage men extends to Dec. 1 and in chemical cold storage to Dec. 15. It does not stand heat at all well, and goes down quickly after becoming mealy and bursting. It varies greatly in keeping quality in different seasons, some years keeping well until late. The crop also ripens unevenly. Some of the apples ripen early and are correspondingly short lived while others ripen later and keep correspondingly later.

**Holland Winter. (Holland Pippin of Hogg, Langley and Miller, and of Western New York. Not the Holland Pippin of Downing and Eastern New York, which is a fall apple.)** This is much less liable to scald than is Rhode Island Greening and some other varieties of green apples.

In the Station tests fruit was stored in 1895 and '97. The mean dates were Oct. 6 for storing; Apr. 5 for average life; and May 26 when the last
fruit went out. The rate of loss was low through the fall and winter but after the first of March it rose rapidly and remained high till the close of the season. The results of both tests were similar, and indicate that the commercial limit for this variety is February or possibly early March.

In the Departme nt cold storage tests large, well-colored, No. 1 fruit from this Station was stored Oct. 21. After Feb. 1 the fruit began to soften. There was no scald till long after its commercial season.

**Hubbardston** (*Hubbardston Nonsuch, Nonsuch, American Blush, Orleans*). Many consider Hubbardston, American Blush and Orleans to be identical varieties while others hold that they are distinct. But Hart has fruited an American Blush which is distinct from Hubbardston. See note on American Blush. Hubbardston is one of the most variable varieties of apples.

It is a very uncertain keeper and should go out early. Morgan remarks that it is thick-skinned and as such would be expected to keep well, but it does not.

In the Station tests fruit was stored in 1896, '97 and '98. The mean dates were Oct. 2 for storing; Mch. 3 for average life; and June 9 when last fruit went out. The rate of loss was comparatively low till the first of January after which it increased rapidly and remained high. Although at the first of March a considerable percentage of the fruit remained sound it had lost much of its original high flavor and quality. The results of the tests were pretty uniform indicating that the commercial limit of this variety is December or possibly early January.

In the Department cold storage tests small, hard, immature fruit, stored Oct. 11, was in prime condition May 1. The results of this test were exceptional. This variety from five other localities, including two in this State, was also tested, but in no other case did it keep nearly so well.

According to storage men the season of this variety extends in cellar storage to December and in chemical cold storage to January. It is not so much affected by heat as some varieties but should nevertheless be kept cool. It goes down quickly. A majority of our correspondents report variously that the inside of the fruit becomes discolored before final decay, that it loses in color and firmness, shrivels, becomes mealy and bursts. But differences differ greatly on these points, that of Graham especially being unlike the majority of the others. Howes reports that if the fruit is of good color it does not vary much in keeping quality, taken one season with another; but some seasons it is off color and such seasons it soon deteriorates. But Morgan remarks that highly-colored specimens go down quicker than those not so highly colored. Wilson says the keeping quality of this variety depends more on size than on color. If there is only a medium crop on the tree the fruit is large and goes down quicker than if the crop is heavy and the individual fruits smaller and firmer. Wilson also believes that this variety should not be picked and put into the barrel at once. The fruit should first lay on straw on the ground for two or three weeks to color.


Huntsman. Holds in cold storage well, season until Feb. 1.

Hurlbut. Fruit was stored in 1896, '97 and '98. The mean dates were Sept. 30 for storing; Feb. 3 for average life; and Apr. 4 for discarding last fruit. The results were quite variable with the different tests. The crop of '98 showed a rather low rate of loss till after the first of April when the fruit began to go down very rapidly. The crop of 1897 went down at a rapid rate from the time it was put into storage. Two-thirds of it went out before the first of December. The crop of '96 showed a pretty high rate of loss before the first of December, a low rate through December and January and a high rate again in February and succeeding months.

In the Department cold storage tests hard fruit, not well-colored, stored Sept. 27, was firm till Apr. 1, after which it softened.

Jacobs Sweet. Not a good keeper. It is said to crack and rot on the tree as well as in storage.

In the Station tests fruit was stored in 1895, '96 and '97. The mean dates were Oct. 7 for storing; Feb. 12 for average life; and June 30 when the last fruit went out. All crops showed a pretty high rate of loss through the fall and early winter indicating that the commercial limit for this variety is November and December, although a considerable percentage of the fruit may remain sound till February or later.

In the Department cold storage tests green, No. 1 fruit stored Sept. 27, 1901, remained firm till Mch. 1, and in good condition in boxes till Apr. 1; no scald. The crop of 1902 began to mellow Feb. 1, but held in good condition in boxes till Apr. 1.

Storage men report its season in cellar storage as extending variously to October or December and in chemical cold storage variously to January or March. It does not stand heat well and goes down quickly after having lost in firmness.

Janet (see Ralls).

Jefferis. In the Station tests 104 apples were stored Oct. 13, 1896. The average life extended to Jan. 18 and the last fruit went out Feb. 9. The rate of loss was low in October but high in November and later, indicating that October is the commercial limit for this variety.

Jennison (see Ralls).

Jersey Sweet. At the Station fruit was stored in 1895, '96 and '97. The mean dates were Sept. 23 for storing; Nov. 19 for average life; and Jan. 18 when the last fruit went out. The results of the tests were pretty uniform and indicate that this variety should not be handled commercially later than September or possibly early October.

Jewett Red (Jewett Fine Red, Nodhead). In the Station tests 104 apples were stored Sept. 29, 1896. The average life extended to Jan. 29 and the last fruit went out May 4. The rate of loss was high in November and early December, rather low from then till the middle of March when it again became high. Our experience with this variety leads us to look upon it as a late fall and early winter sort when grown here. For this locality the commercial limit appears to be October or November.
Jonathan. This variety does not attain to its greatest size in New York State. Its season is about the same as that of Tompkins King.

In the Station tests fruit was stored in 1895,'96 and '97. The mean dates were Oct. 8 for storing; Apr. 6 for average life; and Aug. 1 when last fruit was discarded. The crops of '95 and '96 showed a moderate rate of loss in November and December while that of '97 showed but little loss in November and none in December. In each test a large percentage of the fruit kept till March or later but after the first of January the skin began to show dark spots which detracted much from the commercial value of the fruit. On this account the commercial limit appears to be December or early January.

In the Department cold storage tests small, hard fruit from this Station, stored Oct. 27, was in prime commercial condition May 1, hard and free from rot.

Storage men report the season of this variety in cellar storage as extending to December or January and in chemical cold storage variously to January or March. In deteriorating the fruit is reported to shrivel and to go down gradually.

Jonathan Buler (Buler). In the Station tests 106 apples were stored Oct. 8, 1897. The average life extended to Feb. 24 and the last fruit went out May 6.

In the Department tests the commercial limit of this variety from this Station was found to be Feb. 1 in cold storage. After this date the fruit scalded badly but remained firm until April 1.

Jones (Jones Seedling). In the Station tests 62 specimens were stored Oct. 16, 1896. The average life extended to May 18 and the last fruit was discarded Jul. 12. The rate of loss was low from January to May, after which it became high.

Juicy Krimtartar (see Krimtartar).

Kalkidon (K'halkidonskoe). In the Station tests 45 apples were stored Sept. 28, 1896. The average life extended to Feb. 4 and the last fruit went out May 25. There was a gradual loss of fruit from early in November till the first of March after which the loss became high.

Kansas Greening. In the Station tests 106 specimens were stored Oct. 17, 1896. The average life extended to Apr. 2 and the last fruit was discarded June 30. The rate of loss was low from the first of November till the middle of January after which the fruit went out rapidly.

Kansas Keeper. In the Station tests, fruit was stored in 1896 and '97. The mean dates were Oct. 10 for storing; May 1 for average life; and Jul. 15 when the last fruits went out. The fruit kept well till about the first of February, after which there was a moderate rate of loss till May and then the remaining fruit went out rapidly. Commercial limit appears to be February or March.

In the Department cold storage tests, very hard, immature fruit, stored Oct. 21, was still hard and free from scald or decay June 1.
Keswick (Keswick Codlin). This is a fall variety and should not go into storage.

In the Station tests, fruit was stored in 1895 and '96. The mean dates were Sept. 6 for storing; Oct. 22 for average life; and Nov. 19 for discarding the last fruit. The results are quite similar for the two tests, indicating September and early October as the commercial limit for this variety.

Storage men report its season in cellar storage as August and September and in chemical cold storage until November. It does not stand heat well and goes down quickly.

Khaltidonskoe (see Kalkidon).

King of Tompkins County (see Tompkins King).

Kirtland. In the Station tests 105 specimens were stored Oct. 13, 1897. The average life extended to May 23 and the last fruit was discarded Aug. 12. The rate of loss in December is low, increasing gradually to a moderate rate in May after which it is rapid.

In the Department cold storage tests, dark red, No. 1 fruit from this Station, stored Oct. 21, was in prime commercial condition throughout the storage season; no scald or decay.

Kittagesskeee. In the Station tests, fruit was stored in 1895, '96 and '97. The mean date for storing was Oct. 6; for average life Apr. 14; and for going out Jul. 12. The rate of loss is low or moderate up to the middle of May after which it is high.

Krimtartar (Juicy Krimtartar). In the Station tests 103 apples were stored Sept. 13, 1897. The average life extended to Nov. 26 and the last fruit went out Apr. 4. About 60 per ct. of the fruit went out in October and 23 per ct. in November. The commercial season appears to be September, although a few specimens may keep through the winter.

Lady (Christmas Apple). While this variety is a late keeper it is usually sold at the Christmas season, and seldom held late, as there is little call for it after the holidays. It stands heat well before going into storage.

Lady Henniker (see Henniker).

Lady Sweet (Pommerov, Lady's Sweeting). Ranks hardly with Baldwin as a keeper.

In the Station tests, 29 specimens were stored Oct. 17, 1898. The average life extended to Apr. 30 and the last fruit went out June 12.

In the Department cold storage tests, hard, half-green, immature fruit from this Station, stored Oct. 27, remained hard and sound throughout the storage season.

Storage men report its season as extending in cellar storage to March or April, and in chemical cold storage to May or June. It stands heat well before going into storage and goes down gradually, sometimes after having become soft or shriveled.

Lankford (Langford, Bickers). This variety is one of the worst varieties to scald after midwinter.

In the Station tests fruit was stored in 1895, '96 and '97. The mean
dates were for storing Oct. 17; for average life Apr. 22; and for discarding of last fruit Jul. 15. The rate of loss through the fall and winter is usually low, increasing in March and becoming high in May.

In the Department cold storage tests medium sized, very hard, half-colored fruit from this Station was stored Oct. 21. It began scalding in January but remained hard through the storage season.

Landsberg (Landsberger Reinette). In the Station tests 51 apples were stored Sept. 25, 1895, and 105 apples Oct. 16, 1897. The mean date for storing was Oct. 6; for average life Feb. 23; and for discarding the last fruit Jul. 21. The loss was rather high in November, moderate through the winter and high again from about Mch. 1 till the close of the season.

In the Department cold storage tests bright, No. 1 fruit from this Station, stored Oct. 21, reached its commercial limit Jan. 15, after which the flesh mellowed; no scald.

Large Lady. In the Station tests 105 apples were stored Oct. 3, 1898. Average life extended to May 10 and the last fruit went out Jul. 5. During the fall and winter the loss varied from low to moderate. It became high early in May and continued so till the close of the season. The fruit kept till the first of May with but comparatively little loss.

Lawver (Delaware Red Winter). In the Station tests fruit was stored in 1895, '96 and '97. Average number stored 73. The mean date for storing was Oct. 13; for average life May 4; and for discarding the last fruit Jul. 25. The rate of loss was low till May 1 after which the fruit went out gradually in one case and in the other two tests pretty rapidly. Commercial limit of the variety appears to be March or possibly April.

Storage men give the season of this variety as extending to February or March in cellar storage and to April in chemical cold storage. It stands heat well before going into storage and goes down gradually.

Limbertwig. Season in cellar storage until February and in chemical cold storage until May (Newhall) or Jul. 1 (Graham). It stands heat well before going into storage and goes down gradually.

Longfield. In the Station tests fruit was stored in 1895, '96 and '97. The average number stored was 89. The mean date for storing was Sept. 24; for average life Nov. 30; and for going out Feb. 15. The results of the different tests are pretty uniform showing a high percentage of loss throughout the fall and in fact till the close of the season. The variety does not appear well adapted for holding outside of cold storage. Commercial season September or possibly later.

In the Department cold storage tests clear, well-colored, No. 1 fruit from this Station, stored Oct. 21, in semifirm condition, reached its commercial limit Dec. 1, after which its flesh grew mealy.

Longworth (Longworth Red Winter). In the Station tests 103 apples were stored Oct. 2, 1896, and 65 apples Oct. 16, 1897. The mean date for storing was Oct. 9; for average life Dec. 14; and for going out Feb. 9. The results were not uniform. In 1896, 90 per ct. of the crop was gone by the last of December but in 1897 the rate of loss was moderate up to the middle
of January after which the fruit went down very rapidly. Our experience with the variety leads us to regard the limit of its season at Geneva as November for commercial purposes.

**Lowell** (*Greasy Pippin, Tallow Pippin*). In the Department cold storage tests, No. 1 fruit, stored Sept. 3, reached its commercial limit Oct. 15, after which it softened and lost quality.

**McIntosh** (*McIntosh Red*). This variety is rather earlier than Hubbardston. Its keeping quality is unfavorably affected by the fact that it ripens its fruit very unevenly. Two or three pickings should be made.

At the Station, fruit was stored in 1895, '96 and '97. The mean date for storing was Oct. 1; for average life Jan. 30; and for going out May 12. The results were quite uniform. They showed a high rate of loss from November throughout the season. It cannot be expected to keep much later than October in ordinary storage without considerable loss.

In the Department cold storage tests, well-colored, No. 1 fruit from this Station, stored Oct. 21, 1901, remained firm till Jan. 15 and in good condition in boxes till Mch. 1. In 1902-3 the fruit was firm a month longer.

Cold storage men report its season as extending in cellar storage until November and in chemical cold storage until December or January. It does not stand heat well before going into storage and shrivels like Westfield Seek-no-further.

**McMahon** (*McMahon White*). This variety ripens unevenly.

Fruit was stored at the Station in 1895, '96 and '97. The mean date for storing was Sept. 19; for average life Jan. 19; and for discarding of last fruit Apr. 21. The rate of loss was high from early in October throughout the season. It does not appear well adapted for common storage.

In the Department cold storage tests, No. 1, unevenly-colored fruit from this Station was stored Oct. 21 and reached its commercial limit Dec. 1.

**Magog** (*Magog Red Streak*). Sept. 30, 1896, 51 apples, and Oct. 11, 1897, 78 apples were stored for testing at the Station. The mean date for storing was Oct. 6; for average life Jan. 7; and for discarding last fruit Apr. 14. The results were not uniform in the two tests. In 1896 a large percentage of fruit went out in November and after that the apples went down slowly; but in 1897 the apples began to go down in October, and the loss continued at a rather high rate till the close of the season. The commercial limit appears to be October. Ordinary season for family use October to January or possibly later.

In the Department cold storage tests, No. 1 fruit from this Station was stored Sept. 27 and reached its commercial limit Jan. 15, after which the flesh softened; no scald.

**Maiden Blush** (*Lady Blush*). Fruit of all four seasons was tested at the Station. The mean date for storing was Sept. 20; for average life Feb. 20; and for going out May 3. The results were pretty uniform in that the loss was light through the fall but in December it began to increase and continued at a rather high rate till the fruit was gone. The commercial limit appears to be November or early December. Later than this, although the fruit may appear sound, it is deficient in quality.
In the Department cold storage tests, well-colored, No. 1 fruit from this Station was stored Oct. 21. After Dec. 15 the flesh softened; no scald.

Storage men report its season as extending to October in cellar storage and to November or December in chemical cold storage. It does not stand heat well before going into storage and cars should be iced. It goes down quickly. Newhall reports that in deteriorating it scalds, loses in quality, color and firmness, softens, becomes mealy and bursts, while Howes and Graham report that it does none of these things. Prisch also remarks that it scalds very easily. Howes remarks that it varies greatly in time of maturing in different seasons and that the earlier it matures the less satisfactory it is as a keeper. Morgan remarks that this variety is peculiar in its manner of scalding in that one half of the apple turns almost black.

*Mammoth Blacktwig* (see *Arkansas* or *Paragon*).

**Manchester.** In the Department cold storage tests small, hard, very immature fruit from this Station, stored Sept. 27, was still hard and immature May 1 and free from scald and rot.

**Mann.** This is one of the late keeping varieties, ranking about with Ben Davis in season.

In the Station tests 97 specimens were put in storage Oct. 18, 1895. The average life extended to Apr. 6; and the last fruit was discarded Jul. 24. From November to April the rate of loss was moderate; after that it was high, indicating that the commercial limit is March or April for this variety.

In the Department cold storage tests small, hard, grassy green fruit from this Station, stored Oct. 11, was still hard and green and free from rot or scald May 1. In a test of this variety at the same time from W. T. Mann, Niagara County, fruit grown on clay soil was greener and less attractive at the end of the season than fruit grown on sandy soil.

Cold storage men report the season of this variety as extending in cellar storage to February or March and in chemical cold storage to March or May. According to Hart it stands heat about like the average variety but Shuttleworth says it is one of the best in this respect. It goes down gradually, scalding somewhat.

**Manwaring.** In the Department cold storage tests, No. 1 fruit from this Station, stored Oct. 1, reached its commercial limit Jan. 15, after which it decayed badly.

**Marigold.** At the Station 54 apples were put in storage Oct. 13, 1897. The average life extended to Mch. 6 and the last fruit was discarded June 11. The rate of loss was rather high in November and became high again in January, indicating November or December as the commercial limit for this variety.

In the Department cold storage tests, immature, small fruit from this Station, stored Oct. 11, was still very hard and free from decay but slightly scalded May 1.

**May Seek-no-farther** (*Big Romanite* of some). An old variety not
now generally cultivated. Season in cellar storage, according to Graham, until Mch. 1, and in chemical storage May 1. It goes down gradually and does not scald badly but the skin becomes slightly bitter.

**Melon (Norton Melon).** Fruit was stored in 1896 and '97 at the Station. The mean date for storing was Oct. 5; for average life Mch. 13; and June 21 when last fruit went out. The results are not uniform for the two tests. In 1896 nearly 50 per ct. of the fruit had gone by the last of December; the remaining fruit went out at a uniformly moderate rate. The crop of 1897 kept till the first of February with only 12 per ct. of loss, after which the rate of loss was uniform and moderately high until June. Ordinary limit of season December or January. Later than this the fruit deteriorates in quality even though apparently perfect.

In the Department cold storage tests, hard, green fruit from this Station, stored Oct. 21, 1901, was still hard and green and free from scald or rot May 1, 1902. In 1902-3 the fruit softened after Feb. 1 and decayed considerably.

**Menagere.** In the Station tests 32 specimens were stored Sept. 17, 1896. The average life extended till Apr. 4 and the last fruit went out Jul. 12. Deterioration proceeded at a uniformly low rate from November to the close of the season.

**Milden (Milding).** Oct. 1, 1895, 26 apples and Oct. 12, 1897, 106 apples were stored at the Station. The mean date for storing was Oct. 7; for average life Mch. 4; and for discarding of last fruit May 25. The results of the two tests are pretty uniform. The loss of fruit started at a moderate rate in November and continued at an increasing rate till the close of the season.

**Milligen.** Sept. 30, 1896, 103 apples and Oct. 12, 1897, 104 apples were stored at the Station. The mean date for storing was Oct. 6; for average life Feb. 16; and for discarding of last fruits June 21. The results of both tests are pretty uniform in showing a rather high rate of loss beginning in November and continuing till the close of the season, indicating that the commercial limit for this variety is October.

In the Department cold storage tests firm, No. 1 fruit from this Station, stored Oct. 11, appeared scalded after Jan. 15, though the fruit was firm and only slightly scalded until Mch. 15.

**Minkler.** This variety does not hold perhaps quite so well as Baldwin in storage but is nevertheless a late keeper.

Various storage men report its season as extending in cellar storage to November or to January and in chemical cold storage to December or May. It stands heat well before going into storage and goes down rather gradually, scalding as it does so and losing in quality, color and firmness and the skin becoming bitter.

**Missouri Pippin.** Ranks with Baldwin as a keeper. Season in cellar storage till December (Newhall) or Apr. 1 (Graham) and in chemical cold storage till April (Newhall) or Jul. 1 (Graham). It stands heat well before going into storage and goes down gradually. It scalds and softens according to Newhall but not so according to Graham.
Monmouth (Monmouth Pippin). This variety was tested in all four seasons at the Station. The average number of fruits stored was 84. The mean date for storing was Oct. 18; for average life Mch. 22; and for discarding the last fruit Jul. 14. The results were not uniform as to the rate of deterioration in early winter. The crops of 1895, '96 and '98 showed a rather high percentage of loss before the first of January, whereas the crop of '97 did not show much loss before March. The records indicate that the commercial limit for the variety as grown here is usually November.

In the Department cold storage tests bright, green, No. 1 fruit; stored Oct. 21, was in prime commercial condition May 1, firm and free from rot or scald. Commercial limit in this test about June 1.

Moon. In the Station tests Oct. 2, 1896, 107 apples and Oct. 8, 1897, 50 apples were stored. The mean date for the average life was Mch. 22 and discarding of last fruits June 30. The results of the two tests agree in showing a pretty high percentage of loss in November and a low rate of loss through the latter part of December and the fore part of January, after which the fruit went out rather rapidly. On account of the loss of fruit early in the season this appears to be an unsatisfactory variety for storing, notwithstanding the fact that a considerable percentage of the fruit may keep in good condition till February or later.

Moore Sweet. At the Station fruit from the crops of 1895 and '97 was tested. The average number of fruits stored was 50. The mean date of storing was Oct. 15; of average life Apr. 21; and of deterioration of last fruits Jul. 11. The figures for the two seasons are fairly uniform and indicate that the commercial limit of this variety is April. Deterioration was very gradual throughout the winter.

In the Department cold storage tests No. 1, immature fruit from this Station, stored Oct. 21, was firm and free from decay or scald till Apr. 15, after which it softened.

Mother. At the Station, fruit from the crops of 1896, '97 and '98 was tested. The average number of fruits stored was 86. The mean date of storing was Sept. 18; of average life Jan. 24; and of deterioration of last fruits June 11. The results the different seasons were quite variable. Deterioration proceeded very rapidly the first part of the season, 40 per ct. or more of the fruit going down by Dec. 10. Later the fruit was deficient in quality although it went down very gradually through the winter. These results indicate that this variety is poorly adapted for holding in storage. Commercial limit, November.

In the Department cold storage tests firm, poorly-colored, No. 1 fruit from this Station, stored Sept. 27, was firm till Mch. 15 and semifirm and in good condition in boxes till May 1; no decay or scald.

Munson (Munson Sweet). In the Department cold storage tests fair colored, No. 1 fruit, stored Sept. 29, was in good condition till Jan. 1, after which it softened; no scald or decay.

Nelson. Fruit of the crops of 1895, '96 and '97 was tested at the
Station. The average number of fruits stored was 105. The mean date of storing was Oct. 13; of average life May 31; and of deterioration of last fruits Jul. 2. In 1896 and '97 the fruit was stored in the latter part of October and the average life of the fruit extended both years until about the middle of June; but in 1895 the fruit was stored Oct. 2 and its average life extended only until May 3.

This variety kept with practically no loss until April and very inconsiderable loss until May, after which the fruit went down suddenly. Commercial limit, April or May.

**Newman.** Station tests were made all four seasons. The average number of fruits stored was 76. The mean date of storing was Oct. 12; of average life May 6; and of going down of last fruits Jul. 10. This variety held well until January, then suffered a low rate of loss till March or April, after which it went down rather rapidly. Commercial limit, March or later.

In the Department tests, No. 1 fruit from this Station, stored Oct. 21, was firm and in prime commercial condition May 1; no decay or scald.

**Newtown Spitzenburg.** Station tests were made all four seasons. The average number of fruits stored was 90. The mean date of putting the fruit into storage was Oct. 18; of average life Apr. 25; and of decay of last specimens June 8. The fruit kept well till February except that of the crop of 1895 which showed a high rate of loss in December. The results with this exception were pretty uniform indicating that the usual commercial limit here would be February or sometimes March.

**New Water.** In the Department cold storage tests, No. 1 fruit from this Station, stored Oct. 21, remained firm until Jan. 15, and in good condition till Mch. 1; no decay or scald.

*Nodhead* (see *Jewett Red*).

*Norton Melon* (see *Melon*).

**Northern Spy.** "This variety is variable in storage behavior. It is particularly susceptible to decay from blue mold, especially if bruised or delayed in reaching storage. If well-colored, picked, packed, and handled with great care, and stored soon after picking, it may be carried in storage as long as most winter varieties." (Powell and Fulton.)

"If carefully packed will keep about the same length of time as Rhode Island *Greening*. Its thin skin and abundant juice render careful handling absolutely necessary." (Howes.)

This variety was under observation at the Station all four seasons. The mean of the dates of storing was Oct. 22; of the average life Feb. 16; and of the discarding of the last specimens June 8. The results with this variety were variable. There was always some loss of fruit as early as November. Sometimes the rate of loss in November rose pretty high. It was usually high also in December. From January to May the results were more variable, but usually the loss was moderately low in January, after which it increased gradually. Well-developed and well-colored fruit retains its high quality till late in the season.
In the Department cold storage tests, well-colored, No. 1 fruit from this Station, stored Oct. 21, 1901, was firm and in good commercial condition May 1, 1902. Light-colored fruit stored Nov. 15, 1902, was in good condition till Mch. 1, 1903, after which it decayed considerably.

According to storage men its season in cellar extends to November or February (Howes, Hart) or March or April (Payne). Fenton remarks that it can be kept in common cellars by regulating the temperature very carefully until May 1. In chemical cold storage its season is given as until April. It stands heat fairly well but should go into storage as soon as possible after being picked. Some report it as going down gradually, others quickly. The variety is in nearly all cases reported as being free from objectionable features preceding decay, but only when the fruit is well-colored. This variety is one of the easiest to be bruised and there is much shrinkage in handling it.

**Northwestern Greening.** Observations were made at the Station on the crops of 1895, '96 and '97. The average number of fruits stored was 103. The mean of the dates for storing was Oct. 7; of average life Mch. 11; and of going out June 29. The results were quite uniform in that there was little or no loss in October, a high rate of loss in November and sometimes in December, a moderate rate through mid-winter and a rate varying from high to very high in the closing weeks of the season. On account of the high rate of loss early in the season and continuous loss later it does not promise to be a very satisfactory variety for ordinary storage, yet it is a late keeper. A large part of the fruit does not reach prime condition before January, and much of it remains sound at the close of winter.

In the Department cold storage tests medium-sized, No. 1 fruit from this Station, stored Oct. 21, was hard and free from scald or decay May 1 and in good commercial condition till June 1, when it began to soften.

Storage men report its season as extending in cellar storage to December and in chemical cold storage to May. It stands heat well before going into storage and goes down gradually with loss of quality.

**Oakland (Oakland Seek-no-further).** In our experience with the fruit grown at this Station its season in cellar storage begins late in November or early in December and continues till mid-winter or later.

In the Department cold storage tests bright, hard, No. 1 fruit from this Station, stored Oct. 21, was firm till Mch. 1, and semifirm and in good condition in boxes till Apr. 15; no decay or scald.

**Occident.** Trials were made at the Station in 1895, '96 and '97. The average number of fruits stored was 106. The mean dates were Oct. 21 for storing the fruit; Apr. 25 for its average life; and June 29 for going out of last specimens. In 1895 the keeping quality was exceptionally poor for this variety; the average life extending only to Mch. 12; but in the other years the variety maintained its reputation for excellent late keeping qualities, showing but a very low rate of loss before the middle of March. Ordinary commercial limit March or April; season January to May.

**Ohio Pippin.** In a trial at the Station in 1896 fruits were stored Sept. 2,
The average life was Dec. 1 and the last specimen was discarded Apr. 19. Three-fourths of the crop went down by Nov. 15, the rest going out gradually through the winter. Commercial limit probably October, although the season of this variety is October to January.

**Olive.** Fruit was stored at the Station in 1896 and ’97. The mean date of storing was Oct. 9, of average life Apr. 6 and of going out of last fruits June 30. The fruit kept well until midwinter when it suddenly showed considerable deterioration for a short time, after which deterioration proceeded gradually till spring opened. On account of very considerable loss in January and February the safe commercial limit appears to be December; yet much of the fruit remains sound till March or April.

**Oldenburg (Duchess of Oldenburg).** This variety is too early to go into storage. Its season in cellar storage is given by storage men as August and September. Newhall reports that it loses in quality and firmness if stored, shrivels and becomes mealy and bursts. It does not stand heat and goes down quickly.

**Ontario.** In the Station tests fruit was stored in 1896 and ’98. The average number of fruits stored was 98. The mean dates were Oct. 19 for storing, Apr. 26 for average life and Jul. 9 when last fruits went out. There was a difference of nearly two months in the average life of this variety in the two years. In 1896 the fruit kept well until December, after which it went down at an even and moderate rate through the winter. In 1898 it kept well until Apr. 1, the loss being only nine per ct. up to that time. It maintained but little further loss till May 1, after which the fruit deteriorated rapidly.

In the Department cold storage tests, hard, green, No. 1 fruit, stored Oct. 11, was firm and free from decay or scald Mch. 14, but soft and worthless May 1.

**Ornament (Ornament de Table).** At the Station fruit was stored from the crops of 1896 and ’97. The average number of fruits stored was 101. The mean dates were Oct. 10 for storing, Mch. 15 for average life and June 22 when last fruits went out. Results both seasons were very similar. The loss was moderately high though variable from November to March, after which it became high. Commercial limit early winter. Season November to May.

In the Department cold storage tests, small, light-colored fruit from this Station, stored Sept. 27, was firm and free from scald but was slightly decayed May 1.

**Ostrakoff.** At the Station fruit was stored from the crops of 1896 and ’97. The average number of fruits stored was 104. The mean date of storing was Sept. 23, of average life Dec. 22 and of going out of last specimens Apr. 17. But the average life of the crop of 1896 was considerably more than double that of the crop of 1897. Moreover specimens kept until June 30 in 1896, but only until Feb. 2 in 1897, a difference of nearly 4 months. Both seasons considerable decay appeared in October. In 1896 sixty per ct. of the fruit went out by Feb. 1. In 1898 over one-half went out in October. Evidently this variety would be very unsatisfactory in ordinary storage.
Paragon (*Mammoth Blacktwig*). In the Department cold storage tests hard, green, No. 1 fruit from this Station, stored Oct. 21, was firm but badly scalded Mch. 14. May 1 it was nearly all scalded but still firm and free from decay.

**Perry White.** Fruit of the crops of 1895 and '96 was tested at the Station. The average number of fruits stored was 81. The mean date of storing was Sept. 10, of average life Oct. 25 and of decay of last specimens Nov. 6. Results both seasons were quite similar. The test specimens were all or nearly all spoiled by Oct. 31. Season September and early October.

**Peach.** At the Station Oct. 1, 1897, 85 specimens were put in storage. Their average life extended to Mch. 2 and the last specimens were discarded June 30. The rate of loss was rather high in November and December but moderate through the rest of the winter, becoming high again in spring.

**Peck Pleasant.** Fruit from the crops of 1895, '96 and '97 was stored at the Station. The average number of fruits stored was 115. The mean date of storing was Oct. 19, of average life Mch. 26, and of discarding of last specimens Jul. 6. The fruit of 1895 kept poorly. The loss began late in November and continued at a high rate till the close of the season. But the other crops showed but a low rate of loss till March; the fruit then deteriorated more rapidly. In ordinary seasons the commercial limit would be February, but the season of the fruit is October to March.

In the Department cold storage tests, hard and green fruit from this Station, stored Oct. 11, was firm and free from decay, but was slightly scalded May 1.

Storage men report its season in cellar storage as extending to October to January, or according to Howes, to Mch. 1; season in chemical cold storage till April. It is said not to stand heat before going into storage because heat makes it scald. If not affected by scald it goes down gradually. It is very liable to scald and in deteriorating loses in quality but improves in color in holding.

**Perry Russet.** This variety is not favorably regarded by Newhall for storage purposes. Its season in cellar storage is given as November, in chemical cold storage as March. It does not stand heat before going in and it goes down quickly. In going down it loses in quality and firmness, the skin becomes bitter and the fruit oftens shrivels and becomes mealy.

**Peter.** Similar to Wealthy in season as well as in fruit.

Fruit was stored at the Station from the crops of 1895 and '97. The average number of fruits stored was 84. The mean date of storing was Sept. 24, of average life Feb. 10 and of decay of last specimens May 10. This variety was in season about a month longer in 1895 than in 1897. Deterioration set in in October and continued at a pretty high rate through the winter. Commercial season September and October.

**Pewaukee.** This variety was under test at the Station all four seasons. The average number of fruits stored was 82. The mean date of storing was Oct. 15, of average life Feb. 16 and of decay of last specimens May 10. The average life varied from Dec. 6 in 1895 to Apr. 10 for the crop of 1898, or an
extreme variation of 4 months, thus indicating that the keeping qualities vary much in different seasons. Commercial limit for ordinary storage varies with different seasons from November to January or possibly February. Deterioration is often high in November and lower after that till midwinter when it rises again.

In the Department cold storage tests small, hard fruit from this Station, stored Oct. 11, was hard and green and free from rot May 1.

Cold storage men report its season as extending in cellar storage variously to November or March and in chemical cold storage to February or March or May 1.

According to Newhall it does not stand heat well and goes down rather quickly, with which Graham does not agree. It is variously reported as scalding somewhat in going down, losing in quality and firmness, skin becoming bitter and fruit shriveling and becoming mealy.

**Pifer (Pfeifer).** Fruit of the crops of 1896 and '97 was stored at the Station. The average number was 102. The average life in 1896 was May 5 and in 1897, Jul. 10, a difference of over 2 months. The mean date when the last specimens were discarded was Jul. 28. In 1896 this variety kept with little loss until the middle of April when it went down rapidly, but in 1897 it suffered practically no loss before the first of June.

In the Department cold storage tests hard, green, No. 1 fruit from this Station, stored Oct. 21, was hard and free from scald or decay May 1.

**Pippin.** This name is attached to many different varieties. When used alone very commonly in Eastern New York it means either the Green Newtown or the Yellow Newtown, but may refer to Fall Pippin or to Holland Winter; but in Western New York it is commonly understood to refer to the Fall Pippin.

**Plumb Cider.** Inferior in keeping quality to Hubbardston, cold storage men give its season in cellar storage as extending to October, and in chemical cold storage to January. It does not stand heat before going into storage and goes down rather quickly with loss in quality and firmness and sometimes with bursting of the fruit.

**Pomme Grise (French Russet).** Fruit from the crops of 1896 and '97 was stored at the Station. The average number was 103. The mean date of storing was Oct. 20, of average life Feb. 1 and of decay of last specimens Mch. 17. But there was a difference of over two months in the season of the fruit the two years. The 1897 crop kept quite well until February but the 1896 crop began going down rapidly in November and the last specimens went out Feb. 9.

Cold storage men give its season in cellar storage as extending to January and in chemical cold storage to March. It stands heat before going into storage fairly well and goes down rather gradually. In going down it loses in quality in storage and the skin becomes bitter and the fruit becomes decidedly mealy and bursts.

*Pommeroy (see Lady Sweet.)*
Pomona (Cox Pomona). Fruit from the crops of 1895, '96 and '97 was tested at the Station. The average number stored was 51. The mean date of storing was Sept. 23, of average life Nov. 10 and of going out of last specimens Jan. 30. The fruits had nearly all spoiled by the middle of November. Commercial limit October.

Pound Sweet of Central and Western New York. (See Pumpkin Sweet.) This fruit is large, globular, green, marbled with yellow and with spots or streaks of whitish scarf skin.

Pound Sweet (Red Pound Sweet; not Pumpkin Sweet). Fruit of the crops of 1895 and '96 was under observation at the Station. The average number stored was 77. The mean date of storing was Sept. 9, of average life Nov. 5 and of going out of last specimens Jan. 7. Results both seasons were quite similar. Season October. Deterioration set in early and proceeded rapidly.

Pumpkin Russet. Fruit of the crops of 1895 and '96 was tested at the Station. The average number stored was 84. The mean date of storing was Sept. 9, of average life Nov. 18 and of going out of last specimens Mch. 25. The average life of the fruit was almost the same both seasons. Deterioration began in September and by November the fruit was nearly all spoiled. Season September and October.

In the Department cold storage tests, No. 1 fruit from this Station, stored Sept. 27, was a little past commercial condition and commencing to soften Jan. 6.

Pumpkin Sweet (Lyman Pumpkin Sweet, Pound Sweet of Central and Western New York).

Fruit was tested at the Station in 1895, '96 and '97. The average number stored was 104. The mean date of storing was Sept. 26, of average life Feb. 7 and of going out of last fruits May 18. This variety differed greatly in the length of its season with different crops. The rate of loss is usually high during the fall and its season closes in December or January, although some years a considerable portion of the fruit may remain sound until midwinter or later.

Storage men give its season in cellar storage as extending to Nov. 30, and in chemical cold storage to February. It stands heat before going into storage only moderately well and goes down rather quickly, losing in quality and firmness, shriveling and becoming mealy and bursting.

Ralls (Ralls Genet, Gennetting, Janet, Jennilton). Graham remarks that this is a late keeper, and that it would be a strictly No. 1 commercial apple except for the fact that it cracks and bursts on the tree before picking, a fault which we ourselves have not yet observed.

Fruit from the crops of 1896 and '98 was tested at the Station. The number stored was 96. The mean date of storing was Oct. 20, of average life May 23 and of going out of last specimens Jul. 9. Results for both seasons are almost identical. The fruit kept well until the last of April or early in May when the rate of loss rose gradually, becoming very high in June. Commercial limit April.
According to Newhall its season in cellar storage extends to February and in chemical cold storage to May. It stands heat well before going into storage, and goes down gradually, the skin sometimes becoming bitter and the fruit shriveling, becoming mealy and bursting. This variety is but little grown in New York but as grown here its season is December to May.

**Rambo.** Fruit of the crops of 1895, ’96 and ’97 was under observation at the Station. The average number of fruits stored was 103. The mean date of storing was Oct. 18, of average life Mch. 14 and of discarding last specimens June 13. Results in the different seasons were variable, especially as to rate of loss in late fall and early winter. The loss may be low or high in early November but usually is high in late November and December, becomes moderate in midwinter, then rises again. Commercial limit November, though some fruit may keep until March.

Storage men give its season as extending in cellar storage to November and in chemical cold storage to February. It does not stand heat well before going into storage and goes down quickly, losing in quality and firmness, shriveling, becoming mealy and bursting.

**Rawles Genet** (see **Ralls**).

**Red Canada** (*Canada Redstreak, Steele Red Winter, Red Winter*). Fruit of the crop of 1897, stored Oct. 19, showed an average life of June 9. Several specimens still sound were thrown out Aug. 12 to close the test. The fruit suffered but little loss before the first of March and then the rate of loss did not become high till late in May. Nevertheless after mid-winter it gradually became milder in flavor and lost its characteristic high quality.

In the Department cold storage tests immature, hard, No. 1 fruit from this Station, stored Oct. 21, was firm and free from scald and decay May 1.

Storage men report its season as extending in cellar storage to February and in chemical cold storage to April. It stands heat well before going into storage and goes down gradually.

**Red Russet.** Fruit of the season of 1896, ’97 and ’98 was tested at the Station. The average number stored was 87. The mean date of storing was Oct. 19, of average life Mch. 23 and of going down of last specimens June 5. The results in the different years were fairly uniform and indicate that the commercial limit of this variety is February. The fruit kept well until January or February and the rate of loss usually was not high before March.

**Reinette de Caux** (see **Caux**).

**Reinette Pippin.** Tests were made at the Station all four seasons. The average number of fruits stored was 104. The mean date of storing was Oct. 3, of average life Mch. 5 and of going down of last specimens June 9. An uncertain keeper in fall and early winter, sometimes holding well till midwinter but more often showing a high rate of loss in November, making early November the common commercial limit for handling this variety, although its season extends from October to March.
In the Department cold storage tests hard, immature, No. 1 fruit from this Station, stored Oct. 11, was firm and free from scald Mch. 14, but was slightly decayed. May 1 it was semifirm and good in quality but considerably decayed. Fruit picked in 1901 reached its commercial limit Feb. 1 and by Mch. 14 was badly scalded and specked with rot.

**Rhode Island Greening.** A standard variety for holding in storage.

Tests were made at the Station all four seasons. The average number of fruits stored was 124. The mean date of storing was Oct. 6, of average life Mch. 26 and of discarding last specimens June 15. The crop of 1895 kept poorly, the loss being low till late November when it became high and so continued till the close of the season except for a short period in midwinter, when it was rather low. Ordinarily the fruit kept well till late November, then suffered moderately high loss for a short period, then the rate of loss again became rather low and continued so till March, after which the fruit went down rapidly. Commercial limit January or early February. Season October to March.

In the Department cold storage tests hard, sound, No. 1 fruit from this Station, stored Oct. 11, 1902, was in good commercial condition till Mch. 15, when it began to discolor and soften. Fruit picked in 1901 gave similar results except that it scalded.

Storage men give its season in cellar storage as till February and in chemical cold storage till Apr. 1. It does not stand heat well before going into storage as this induces scald. If in good condition the fruit goes down in storage gradually but if affected by any disease, quickly. In going down it scalds badly in storage, loses in quality, turns yellow, becomes mealy and large specimens are liable to burst. Wilson believes that this variety is commonly picked too early for holding in common storage and that this accounts for the prevalence of scald. But cold storage men hold that it should be picked while it is still quite green, that is, in the last half of September. Thus picked it will carry through until very late in the season without any scald. But such fruit does not have the flavor and quality of fruit that is allowed to become riper on the tree. It is even more essential that this variety be hurried into storage at once than the average variety. To bring the best price Rhode Island Greenings must be green in color and free from yellow or any blush.

**Ribston (Ribston Pippin).** Possibly equal to Tompkins King as a keeper. Season according to storage men, in cellar storage till November and in chemical cold storage till February. It stands heat before going into storage fairly well but goes down rather quickly though not dangerously so.

**Ridge (Ridge Pippin).** Inferior to Hubbardston as a keeper. Season according to storage men, in cellar storage till October and in chemical cold storage till January. Stands heat before going into storage moderately well and goes down rather quickly. In going down it scalds, loses in quality, color and firmness, skin becomes bitter and the fruit becomes mealy and bursts.
Roman Stem. Reports on this variety differ widely. Graham reports that it keeps well. Season in chemical cold storage till Apr. 15. Newhall reports that it is a poor keeper, with season in chemical cold storage till January and in common storage till November.

Rome (Rome Beauty). This is reported to be one of the best keepers grown. According to Graham it scalds if picked too green but if left on the tree until it gets its color it is free from this and other undesirable peculiarities which so often precede decay. This variety, the report continues, will stand hard usage.

Tests were made at the Station all four seasons. The average number of fruits stored was 96. The mean date of storing was Oct. 14, of average life Apr. 27 and of decay of last specimens June 25. Results were quite uniform and indicate March as the commercial limit of this variety. The fruit kept well until May when it went down rapidly.

In the Department cold storage tests, hard, light-colored, No. 1 fruit from this Station, stored Nov. 15, 1902, was firm and sound Mch. 14. Fruit picked in 1901 was in good commercial condition until May 1.

Graham reports its season in chemical cold storage as until Jul. 1, "but we have held it until Aug. 4 in ice storage with practically no shrinkage." According to Newhall this variety ranks between Rhode Island Greening and Baldwin in keeping quality, with season in common storage until February, and in chemical cold storage until May. It stands heat well before going into storage, but contrary to Graham’s experience, Newhall states that in going down it scalds late, loses in quality, color and firmness, skin becomes bitter and the fruit becomes mealy and bursts.

Romna. Tests were made at the Station with fruit from the crops of 1896 and '97. The average number of fruits stored was 67. The mean date of storing was Sept. 5, of average life Dec. 25 and of going down of last specimens Feb. 6. The results both seasons were quite uniform, indicating that the commercial limit of this variety is early October. Deterioration commenced early and proceeded rapidly. The fruit was practically all gone by Feb. 1. Season September to January.

Ronk. Fruit from the crops of 1896 and '97 was stored at the Station. The average number of fruits stored was 84. The mean date of storing was Oct. 7, of average life Mch. 26 and of going down of last specimens Jul. 6. January appears to be the commercial limit of this variety. Deterioration proceeded most rapidly in March and April, but otherwise regularly from fall to spring. Season November to March.

Roxbury (Roxbury Russet). As grown in New York this is one of the latest-keeping of all varieties.

Tests were made at the Station all four seasons. The average number of fruits stored was 102. The mean date of storing was Oct. 15, of average life Apr. 26 and of discarding last specimens Jul. 17. The keeping quality of this variety fluctuated widely in different seasons. The fruit of 1895 went down at a rapid rate from November to February while in the other years the fruit commonly showed but a very low rate of loss till March or
April, after which it went down rapidly. The ordinary commercial limit is April or May.

In the Department cold storage tests No. 1 fruit from this Station, stored Nov. 15, was firm and free from decay May 1. Storage men give its season in cellar storage as extending to May and in chemical cold storage to July. It is reported to vary less from season to season than do most varieties. It stands heat about as well as any variety before going into storage. It goes down gradually, scalding a little some seasons, losing in quality and firmness if kept too late, shriveling, becoming mealy and bursting. Hoag remarks that this variety holds in better condition if kept rather damp.

**St. Lawrence.** This variety is too early to go into storage as a rule.

Fruit was stored at the Station in 1895, '96 and '97. The average number of fruits stored was 83. The mean date of storing was Sept. 24, of average life Dec. 24 and of discarding last specimens Mch. 16. This variety fluctuated widely in keeping quality in different seasons. October appears to be its commercial limit. The fruit began going down in October and by Jan. 1 one-third or more was gone.

Storage men report its season in cellar storage as October and in chemical cold storage until December. It does not stand heat well before going into storage and goes down quickly. In going down it is variously reported as scalding, losing in quality and firmness in storage, skin becoming bitter, shriveling, becoming mealy and bursting. Britton remarks that the fruit may not remain on the tree until it becomes well-colored and that unless it is well-colored it fades in the barrel to a gray color, rendering it almost valueless. But Howes remarks that the fruit retains firmness if fully ripe and that the bitterness of the skin is due to the fruit being picked too green.

**Salome.** In the Station tests fruit of the crops of 1895, '96 and '97 was stored, the average number of specimens put under test being 94. The mean date of storing was Oct. 19, of average life Apr. 10 and of going down of last fruits Jul. 7. The fruit of 1895 kept poorly and went down at a rather rapid rate from mid-November till the season closed. In the other years the fruit kept well till the last of March, after which the rate of loss gradually increased. Commercial limit March but in exceptional seasons December.

In the Department cold storage tests No. 1 fruit from this Station, stored Oct. 21, was in good condition till Apr. 1, when scald appeared freely. June 1 it was still hard but all scalded.

Storage men give its season in cellar storage as extending to January and in chemical cold storage to May. It stands heat well before going into storage and goes down gradually.

**Schodack.** In the Station tests 30 apples, stored Oct. 29, 1897, showed an average life of Jul. 18. A number of specimens still in good condition were thrown out Aug.12 to close the test. Decay began in April but proceeded only slowly until July. Commercial limit appears to be June.

*Scott* (see *Baker*).
Scott (Scott Winter). In the Station tests fruit from the crops of 1895, '96 and '97 was stored. The average number put under test was 71. The mean date of storing was Oct. 10, of average life Mch. 22 and of discarding last specimens June 30. Results were quite uniform all three seasons and indicated that the season of this variety extends to March.

In the Department cold storage tests No. 1 fruit from this Station, stored Oct. 21, was sound, firm and free from scald May 1 but slightly wilted.

Seek-no-further (see Westfield Seek-no-further.)

Sharp. Fruit of the crops of 1895, '96 and '97 was under observation at the Station. The average number of apples stored was 65. The mean date of storing was Sept. 29, of average life Mch. 1 and of going out of last specimens June 30. The differences in keeping quality the different seasons were very great. Common commercial limit November, but the crop of 1897 kept well until March.

In the Department cold storage tests small, hard, immature fruit from this Station, stored Oct. 21, was firm until Jan. 15 and semifirm until Mch. 15, after which scald appeared and the fruit softened.

Sherwood Favorite (see Chenango).

Shiawassee (Shiawassee Beauty). A fall variety, season in cellar storage September, and in chemical cold storage until December. It stands heat before going into storage poorly and goes down rather quickly.

Small Admirable (see Admirable).

Smith Cider. In the Station tests 51 apples were stored Oct. 1, 1895. Their average life was Mch. 3 and the last specimens were thrown out Jul. 24. There was a moderate loss in October but a high rate of loss in November and December. Storage men give its season in cellar storage as extending to March and in chemical cold storage to May. It stands heat well before going into storage and goes down gradually. It scalds badly and in going down loses in quality, color and firmness, skin becomes bitter and the fruit shrivels, becomes mealy and bursts.

Snow (see Fameuse).

Spitzburg (see Esopus Spitzburg and Newtown Spitzenburg).

Spy (see Northern Spy).

Stanard. At the Station fruit was tested in 1896 and in '97. The average number stored was 100. The mean date of storing was Oct. 4, of average life Jan. 19 and of discarding of last specimens Apr. 30. Its season extends to January but the commercial limit appears to be early October.

In the Department cold storage tests highly colored, No. 1 fruit from this Station, stored Oct. 21, 1901, was in good commercial barrel condition till Apr. 1 and semifirm and in good box condition till May 1; no scald or rot Fruit stored Sept. 27, 1902 was mellow after Mch. 1.

Stark. Observations were made at the Station on fruit from the crops of 1895 and '97. The average number of fruits stored was 110. The mean date of storing was Oct. 9, of average life May 21 and of going out of
last specimens Aug. 17. There was considerable difference in the length of the commercial season the two years. Its usual commercial limit is May. The crop of 1895 showed a pretty high loss late in December, otherwise the fruit of both seasons kept till May with but little loss. Season January to June.

In the Department cold storage tests hard, greenish red, No. 1 fruit from this Station, stored Oct. 21, was hard and free from scald or decay June 6 when removed from storage.

Storage men give its season in cellar storage as extending to February and in chemical cold storage to May. It stands heat well before going into storage and goes down gradually. It is reported to improve in color in common storage. In going down it is reported to scald late in the season, lose in quality and sometimes in firmness, the skin to become bitter and the fruit to become mealy and burst.

Stayman Winesap. In the Department cold storage tests medium sized, rather dull-colored, No. 1 fruit from this Station, stored Oct. 21, was in good condition till Apr. 1, when the fruit began to scald. May 1, 65 per ct. of the fruit was scalded, the balance still hard.

Storage men report that this variety holds well in storage but is liable to scald.

Streaked Pippin. Fruit stored in 1897 showed an average life of Apr. 12, the last specimens being thrown out June 30. There was practically no loss till February, after which there was a uniform and moderate loss till the close of the season.

Strode (Strode Birmingham). This is a fall variety which should be handled commercially in September. A few specimens may keep until January.

In the Department cold storage tests small, greenish-yellow fruit from this Station, stored Sept. 27, was in good condition till Dec. 15, after which the skin cracked open while the fruit was still firm.

Stump. At the Station fruit was stored in 1895 and '96, the average number put under test being 101. The mean date of storing was Sept. 6, of average life Nov. 15 and of going out of last specimens Jan. 27. Results both seasons were very uniform in that the fruit went down very rapidly in October, indicating September or possibly early October as the commercial limit for this variety. Season September to November.

Sugar Barbel (see Barbel).

Sutton (Sutton Beauty). Tests were made at the Station all four seasons. The average number of fruits stored was 98. The mean date of storing was Oct. 8, of average life Mch. 26 and of decay of last specimens June 13. The fruit usually keeps pretty well till late February or March but it kept poorly in 1895. The loss with that crop became heavy in November and then dropped to a low rate through the winter becoming high again in March. Commercial limit of this variety appears to be February. Season November to March.
In the Department cold storage tests medium-sized, well colored but rather dull No. 1 fruit from this Station, stored Oct. 27, was firm for barrel storage till Mch. 15 and in good condition for box storage till Apr. 15.

Storage men report its season in cellar storage as extending to January, in chemical cold storage to March. It stands heat fairly well before going into storage and goes down gradually.

**Swaar.** Fruit was stored at the Station in 1896 and in '97. The average number stored was 106. The mean date of storing was Oct. 16, of average life Apr. 6 and of going out of last specimens June 3. The season differed considerably for the two years but appears to extend to the last of February. It shrivels as it begins to deteriorate. It went down gradually until March one season and until May the other, and then decayed rather suddenly. In the Department cold storage tests, hard, green, No. 1 fruit from this Station, stored Oct. 21, was firm and free from decay but slightly scalded May 1.

Its season in cellar storage is given as extending to December (Newhall, Hart) or Mch. 1 (Howes), and in chemical cold storage to February or Apr. 15 according to different correspondents. It stands heat fairly well and goes down gradually. It improves in color in storage but the skin becomes bitter.

**Swenker.** Fruit of the crop of 1896, stored Oct. 3, showed an average life of Mch. 11, the last specimens going out June 8. They went down gradually. There was a high rate of loss in November, afterwards a low rate till March when it became high again. Commercial limit February. Season December to March.

**Tallow Pippin** (see Lowell).

**Texas** (*Pride of Texas*). In 1896, 111 apples and in 1897, 105 apples were tested. The mean date of storing was Oct. 9, of average life May 6 and of discarding last specimens Jul. 28. The fruit of 1897 kept with no loss till April; the rate of loss was then small till late in May, when it became heavy. The crop of 1896 kept poorly for this variety, losing heavily in December and January and again in March. The season of the variety usually extends to May.

In the Department cold storage tests small, hard, green fruit, stored Oct. 21, was firm and free from rot but considerably scalded May 1.

**Tobias.** Fruit of the crop of 1896 showed an average life of Dec. 24, with the last specimens going out Apr. 19. It went down gradually from November through the winter.

**Tobias Pippin.** Fruit of the season of 1896 showed an average life of Jan. 5, the last specimens going out June 8. One-half of the specimens went down in November and early December. Commercial limit October or possibly November.

**Tolman Sweet.** Tests were made at the Station all four seasons. The average number of fruits stored was 72. The mean date of storing was Oct. 8, of average life Mch. 8 and of discarding of last specimens
May. 30. This variety differed in keeping quality considerably in the different seasons. The fruit usually went down gradually through the winter, but the crops of 1895 and '98 showed a heavy loss in November and December. Commercial limit December or January. Season December to March.

In the Department cold storage tests small, hard, No. 1 fruit from this Station, stored Oct. 1, was firm and free from decay but slightly scalded May 1.

Storage men report its season as extending in cellar storage to December or January, though Phillips Bros. say to March, and in chemical cold storage to Feb. 1 or April, according to different correspondents. It stands heat before going into storage only fairly well and goes down quickly according to some, gradually according to others. In going down it scalds some, shrivels a little and becomes somewhat mealy but improves in color. This variety requires very careful handling for it shows bruises very readily.

Tompkins King (King of Tompkins County). Tests were made at the Station all four seasons. The average number of fruits stored was 98. The mean date of storing was Sept. 28, of average life Mch. 4 and of going out of last specimens June 26. The average life of this variety differed greatly in the different seasons, ranging from Dec. 26 to Apr. 11. There is apt to be considerable loss of fruit in November and sometimes it occurs even as early as October, so that the commercial limit is December or exceptionally January. Season October to January or later.

In the Department cold storage tests small, hard and green fruit from this Station, stored Sept. 27, was green and hard and free from scald or decay May 1.

Storage men give its season in cellar storage as extending to December or January and in chemical cold storage to February.

It is not so much influenced by differences in season as are many varieties. It stands heat before going into storage fairly well and goes down gradually, though Newhall says quickly after deterioration has set in. In going down it scalds, loses in quality and becomes mealy.

Tufts. Tests were made at the Station with fruit of the crops of 1895, '96 and '97. The average number of fruits stored was 50. The mean date of storing was Sept. 30, of average life Dec. 14 and of discarding of last specimens May 6. The average life varied considerably different seasons. The rate of loss was high in October and November. One-half or more of the specimens had decayed by Dec. 1. Commercial limit October. Season October to January.

In the Department cold storage tests hard, greenish red, No. 1 fruit from this Station, stored Sept. 27, was firm and sound Mch. 14; May 1 it was softening and slightly scalded but not decaying.

Tulpehocken (see Fallawater).

Twenty Ounce (Cayuga Red Streak, Wine; Cabashaw incorrectly). A fall apple which usually should be handled direct to the consumer and not go into
storage at all. But Hoag says that when allowed to remain on the tree until it gets its color it holds well in cold storage.

Fruit of the crops of '95, '96 and '97 was under observation at the Station. The average number of fruits stored was 95. The mean date of storing was Sept. 28, of average life Jan. 20 and of discarding last fruits Mch. 31. The fruit goes down rapidly in October and November. Commercial limit, November.

In the Department cold storage tests, well colored, No. 1 fruit from this Station, stored Sept. 29, 1902, was mellow and commencing to decay Jan. 6. Fruit picked in 1901 kept well till Feb. 1.

Storage men give its season in cellar storage as extending to November. It does not stand heat well and goes down quickly. Howes remarks that it cannot be held so long in those seasons when it does not color well; also that spraying sometimes roughens its thin skin. It holds its color if well colored on the tree, but never colors after picking. Some report that it is liable to lose in quality, to shrivel, to become mealy or to burst while others report just the opposite.

Twenty Ounce Pippin (of some; see Cabashea). There is another variety which is known in some parts of Western New York under the name of Twenty Ounce Pippin the identity of which we have not yet determined. In size and coloring it somewhat resembles a smooth roundish Twenty Ounce, but is less mottled and more striped with red. It is distinct from Twenty Ounce in the flavor and texture of the flesh and in the character of the core. It is reported as a better keeper than Tompkins King.

Vandevere (of Western New York) (see Newtown Spitzenburg).

Vanhoy. The fruit of 1895 and of '96 was tested at the Station. The average number of fruits stored was 89. The mean date of storing was Oct. 17, of average life Apr. 30 and of discarding last fruits June 14. Both tests gave quite similar results. Season January to May. Commercial limit March. There was practically no loss before midwinter.

In the Department cold storage tests, hard, green, fair, No. 1 fruit from this Station, stored Oct. 21, was firm and free from rot but considerably scalded May 1.

Victoria (Victoria Sweet.) Fruit of 1896 and of '97 was tested at this Station. The average number stored was 82. The mean date of storing was Oct. 6, of average life Feb. 3 and of decay of last fruits Apr. 21. Results the two seasons were fairly uniform. The rate of loss was rather high in December and moderate from then till February when it became very high. Season October to January. Commercial limit October.

In the Department cold storage tests well-colored, No. 1 fruit from this Station, stored Oct. 21, was beautifully colored and quite mellow Jan. 10.

Wagener. Fruit of the crops of 1896 and of '98 was tested at the Station, the average number stored being 62. The mean date of storing was Oct. 20, of average life May 5 and of discarding of last fruits June 27.
Results both seasons were very similar. The fruit kept well till March, after which the loss was high. Season November to February. Commercial limit December. This is a delicate apple and subject to scald. It loses flavor late in the season though apparently sound.

In the Department cold storage tests hard, well colored, No. 1 fruit from this Station, stored Nov. 15, was firm and free from decay and scald Mch. 14. May 1 it was soft and considerably decayed but free from scald.

Storage men give its season in cellar storage as extending to December and in chemical cold storage to February. It does not stand heat well before going into storage and goes down rather quickly. In going down it is reported to scald, lose in quality, color and firmness and to become mealy and burst. Powell and Fulton remark that this variety, unless highly colored, is one of the worst to scald after midwinter.

Walbridge. At the Station fruit of the crops of 1895, '96 and '97 was under test. The average number of fruits stored was 108. The mean date of storing was Oct. 8, of average life Apr. 15 and of discarding of last specimens June 23. The crop of 1895 kept poorly and showed a high rate of loss, beginning in the latter part of December and continuing till the season closed. In the other years results were more normal and there was but little loss till March, when it became high. Commercial limit February.

In the Department cold storage tests hard, green, fair, No. 1 fruit from this Station was stored Oct. 21. After Mch. 15 the fruit softened and much of it became mealy.

Storage men give its season in cellar storage as February and in chemical cold storage as May. It stands heat well before going into storage and goes down very gradually, scalding and losing in quality, color and firmness. Powell and Fulton remark that this variety often ripens unevenly and becomes mealy and discolored in flesh while the skin is bright in color.

Wallace Howard. Fruit of the crop of 1897 showed an average life of Mch. 27, with the last fruits going out June 11. It showed a low rate of decay from November till March then went down more rapidly. Season November to March or later.

Washington Royal. Fruit of the crops of 1895, '96 and '97 was tested at the Station. The average number of fruits stored was 101. The mean date of storing was Oct. 11, of average life Mch. 26 and of going out of last fruits June 21. The different seasons gave widely different figures for average life, ranging from Jan. 28 to June 5. The fruit went down continuously through the winter from November; but in 1895 at a rapid rate, in 1896 at a moderate rate and in 1897 at a low rate. On account of its variable keeping qualities November is the safe commercial limit for fruit grown here although the season extends to May or June.

In the Department cold storage tests small, hard, green fruit from this Station, stored Oct. 11, was mellow but free from rot or scald Apr. 30. Commercial limit Mch. 1; fruit softens without developing yellow color.
Washington Strawberry. Fruit of the seasons of 1895, '96 and '97 was tested at the Station. The average number stored was 46. The mean date of storing was Sept. 12, of average life Dec. 24 and of going out of last specimens Apr. 12. This variety varied greatly in the length of its season with the different years. The fruit went down rapidly in October and November. Its season may extend to December. Commercial limit October.

In the Department cold storage tests light-colored, No. 1 fruit from this Station, stored Oct. 21, was meadow but free from scald or rot Jan. 10. Commercial limit Dec. 1.

Wealthy. Station tests were make with fruit of 1896 and '98. The average number stored was 71. The mean date of storing was Sept. 18, of average life Feb. 8 and of discarding last fruits May 1. There was a difference of over four months in the average life of the variety in the two seasons. One-half of the fruit went down by Dec. 1. Commercial limit October.

In the Department cold storage tests small, hard and immature fruit, stored Sept. 27, was semifirm and slightly decayed but free from scald Mch. 14.

Storage men give the season of this variety in cellar storage as October and in chemical cold storage January. The variety does not stand heat well before going into storage and goes down rather quickly, losing in quality and firmness, becoming somewhat mealy and occasionally bursting.

Western Beauty (see Chase).

Westfield Seek-no-further. Ranks about with Baldwin as a keeper. Storage men give its season in chemical cold storage as extending to March. It shrivels badly.

White Doctor. Station tests were made all four seasons. The average number of fruits stored was 88. The mean date of storing was Oct. 12, of average life Apr. 9 and of going out of last fruits June 17. There was an extreme difference of over three months in the average life of the fruit in different seasons. The crop of 1895 kept poorly and began to show high rate of loss by the last of December. On the other hand the crop of 1898 showed practically no loss till May. Season usually December to April. Commercial limit early February.

In the Department cold storage tests small, greenish-yellow fruit from this Station, stored Sept. 27, was semifirm, slightly decayed and all specimens slightly scalded Mch. 14. Commercial limit Feb. 1.

White Pippin. Station tests were made all four seasons. The average number of fruits stored was 108. The mean date of storing was Oct. 13, of average life Apr. 1 and of going out of last fruits June 29. There was an extreme difference of four months in its average life in the different seasons. The fruit of 1895 kept very poorly, showing a high rate of loss from October till midwinter but in other years the rate of loss was low or moderate till March or April after which it became high, indicating Febru-
ary as the ordinary commercial limit and November to May as the season for this variety.

In the Department cold storage tests sound, No. 1 fruit from this Station, stored Oct. 11, 1902, was firm and free from scald Mch. 14. Commercial limit Apr. 15. Fruit picked in 1901 softened rapidly and decayed after Mch. 1.

Wine (of some). (See Twenty Ounce.)

Winesap. Fruit of 1895, '96 and '97 was tested at the Station. The average number of fruits was '97. The mean date of storing was Oct. 16, of average life May 24 and of discarding of last fruits Jul. 11. The results for all three seasons were quite similar. In 1897 the loss became moderately high in January, and very high in March. In other years it remained low till May then became very high, indicating April as the ordinary commercial limit and January to June as the season for this variety as grown at Geneva.

In the Department cold storage tests, hard, small, light-colored fruit from this Station, stored Oct. 21, was firm and free from scald or decay Mch. 14. Apr. 30 the fruit was still hard and free from decay, but about 75 per ct. scalded.

Storage men give the season of this variety as extending in cellar storage to February and in chemical cold storage to April. It stands heat well before going into storage and goes down gradually with scalding.

Winter Banana. As grown at this Station the season of this variety in common storage extends from late November or early December till about the first of March, but its safe commercial limit would probably not extend much beyond December.

Storage men give its season in cellar storage as extending to December, and in chemical cold storage to April. It stands heat well before going into storage and goes down gradually, scalding and losing in quality, color and firmness.

Wolf River. Fruit of 1896 and '97 was tested at the Station. The average number of fruits stored was 56. The mean date of storing was Sept. 13, of average life Jan. 25 and of discarding last fruits June 12. The rate of loss is high in November and December, indicating October as the commercial limit and September to December as the season for this variety. Some of the fruit may keep later than this apparently in good condition but it is deficient in quality.

In the Department cold storage tests large, bright, No. 1 fruit from this Station, stored Sept. 27, was in prime commercial condition Jan. 6, and free from rot or scald.

Storage men report that this variety does not stand heat well and goes down quickly.

Yellow Bellflower. Fruit of 1895, '96 and '97 was tested at the Station. The average number of fruits stored was 107. The mean date of storing was Oct. 4, of average life Mch. 7 and of discarding of last
fruits June 12. There was a difference of three months in the average life of the variety in different seasons. In 1895 it kept poorly, beginning to decay at a rapid rate as early as October and continuing till the season closed. In the other years it kept well till February or March then began to decay rapidly. Commercial limit January or February. Season November to April.

Storage men report this variety to rank between Rhode Island Greening and Baldwin as a keeper. Its season is reported as extending in cellar storage to January and in chemical cold storage to March. It does not stand heat well before going into storage and goes down quickly. Its keeping quality is not so much affected by differences of season as is the case with many varieties. Some report that in going down it scalds, loses in quality and firmness, becomes mealy and bursts, but experiences are contradictory on all these points. It improves in color in storage. This variety must be handled very carefully because it is very easily bruised.

**Yellow Forest.** Fruit stored in 1895 showed an average life of Apr. 22, with the last fruits going out Jul. 24. There was a moderate rate of loss from November to May, after which the fruit went down more rapidly.

**Yellow Newtown (Albemarle Pippin).** Usually equal to Baldwin as a keeper. Season in cellar storage is reported by storage men as extending to February and in chemical cold storage to April. Graham reports that it stands heat very well before going into storage and that it goes down gradually. But Newhall reports that it does not stand heat well. It appears that this variety is often confused with the Green Newtown but it is not so good a keeper as the Green Newtown.

**York Imperial (Johnson Fine Winter).** At the Station fruits of 1895, '96 and '97 were tested. The average number stored was 95. The mean date of storing was Oct. 18, of average life May 5 and of decay of last fruits Jul. 7. The results all three seasons were quite similar. The rate of loss is low till April or May then rises very rapidly. When it does not scald its commercial limit is March and season January to May as grown at Geneva.

In the Department cold storage tests, medium to small, light-colored, very hard fruit from this Station, stored Oct. 21, 1901, began to scald Feb. 15, 1902, and a month later three-fourths of the fruit was lightly scalded on the green side. The fruit remained firm throughout the season. Commercial limit Feb. 15 to Mch. 15.

Storage men give its season in cellar storage as extending to December and in chemical cold storage to February. It stands heat fairly well before going into storage but goes down rather quickly, scalding, losing in color and the skin becoming bitter.

**Zurdel (White Zurdel).** Fruit stored in 1897 showed an average life of May 30, the last fruits going out Jul. 18. There was no loss till February and no considerable loss till April.