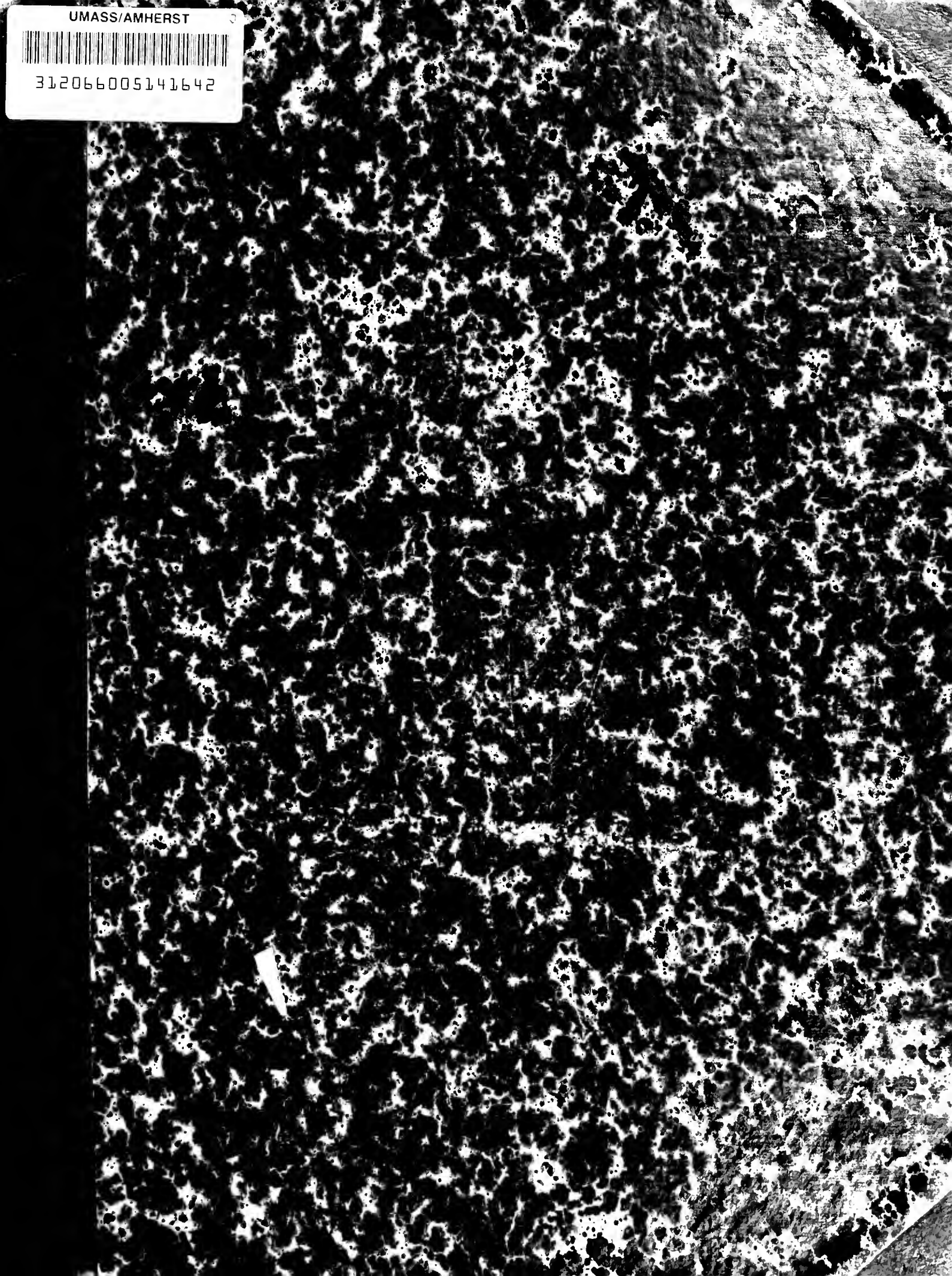

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INGS

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OF THE

American Pomological Society,

HELD IN

BOSTON, MASSACHUSETTS.

September 14th, 15th and 16th, 1887.

TOGETHER WITH THE

STATE FRUIT REPORTS

AND

CATALOGUE OF FRUITS.

PUBLISHED BY THE SOCIETY
1888.

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Parsons, S. B. ..... Flushing ..... New York.
Perry, John B. ..... New York ..... New York.
Pierce, R. W. ..... Florida.
Ransom, Luther ..... Columbia ..... South Carolina.
Richardson, J. C. ..... Greenville ..... Alabama.
Rooks, O. P. ..... Gardenia ..... Florida
Reasoner, P. W. ..... Manatee ..... Florida.
Rumph, Samuel H. ..... Marshallville ..... Georgia.
Rountree, Austin W. ..... New Orleans ..... Louisiana
Riley, C. V. ..... Entomologist, Washington, Dist. Columbia.
Satterlee, James ..... Lansing ..... Michigan.
Scott, E. H. ..... Ann Arbor ..... Michigan.
Saul, John ..... Washington, Dist. Columbia.
Smith, A. M. ..... St. Catherines ..... Ontario.
Smith, J. M. ..... Green Bay ..... Wisconsin.
Saunders, William ..... Ottawa ..... Ontario.
Sturtevant, Dr. E. Lewis ..... Geneva ..... New York.
Starr, C. R. H. ..... Port Williams ..... Nova Scotia.
Stevens, Abel F. ..... Wellesley ..... Massachusetts
Safford, A. P. R. ..... Tarpon Springs ..... Florida
St. Ceran, Edgar L. ..... Ponchatoula ..... Louisiana
Strentzel, Dr. John ..... Martinez ..... California.
Simonds, O. C. ..... Wright's Grove, Cook Co., Illinois.
Thurlow, T. C. ..... Newburyport, Massachusetts.
Taylor, E. B. L. ..... Rochester ..... New York.
Taber, G. L. ..... Glen St. Mary ..... Florida
Troop, Prof. J. ..... Lafayette ..... Indiana
Vaughan, J. C. ..... Chicago ..... Illinois.
Van Deman, H. E. ..... Washington, Dist. Columbia
Watrous, C. L. ..... Des Moines ..... Iowa.
Wolverton, L. ..... Grimsby ..... Ontario
Webb, A. D. ..... Bowling Green ..... Kentucky.
Wilcox, C. H. ..... Oroville, Butte county, California.

Act of Incorporation.

COMMONWEALTH OF MASSACHUSETTS, 1887.

SECTION 1. Patrick Barry, of Rochester, New York, Charles W. Garfield, of Grand Rapids, Michigan, Benjamin G. Smith, of Cambridge, Massachusetts, J. J. Thomas, of Union Springs, New York, Prosper J. Berckmans, of Augusta, Georgia, Robert Manning, of Salem, Massachusetts, their associates, the Officers and Members of the Association known as the American Pomological Society, and their successors, are hereby made a corporation under the name of "American Pomological Society," for the purpose of promoting and encouraging the culture of fruit, with all the powers and privileges and subject to all the duties and liabilities set forth in the general laws which are now or may hereafter be in force applicable to such corporations.

SEC. 2. Said corporation may, for the purpose aforesaid, have and hold by purchase, grant, gift or otherwise, real and personal property to an amount not exceeding one hundred thousand dollars.

SEC. 3. Said corporation may hold its annual meeting, or any special meeting in any place, state or country it may determine, providing that due notice shall be given to the members thereof of the time and place of said meeting.

SEC. 4. Any two of the corporators above named are hereby authorized to call the first meeting of said corporation in the month of September next ensuing, by due notice thereof to each member of said Association.

Copy of Bequest From the Will of the Late Marshall P. Wilder.

ELEVENTH. "I give to the American Pomological Society *one thousand dollars*, the income of which shall be, from time to time, offered in *Wilder Medals* for objects of special merit.

"Also, the further sum of *four thousand dollars*, for the general purposes of the Society."

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN POMOLOGICAL SOCIETY.

CONSTITUTION.

ARTICLE 1. The name of this Association shall be the AMERICAN POMOLOGICAL SOCIETY.

2. Its object shall be the advancement of the science of Pomology.

3. It shall consist of delegates appointed by Horticultural, Agricultural, and kindred Societies in the United States and British America, and of such other persons as take an interest in the welfare of the Association, and are desirous of promoting its aims.

4. The meetings shall be held biennially, at such time and place as may be designated by the Society; and special meetings may be convened at any time on the call of the President.

5. The officers shall consist of a President, a First Vice President, one Vice President from every State, Territory and Province; a Treasurer and a Secretary; and shall be elected by ballot or otherwise at every biennial meeting.

BY-LAWS.

1. The President shall have a general superintendence of the affairs of the Society during its vacation; give due public notice of the time and place of meeting; preside at its deliberations; deliver an address on some subject relating to Pomology, at every biennial meeting; and appoint all committees unless otherwise directed.

2. In case of the death, sickness, or inability of the President, his official duties shall devolve on the First Vice President or such one of the Vice Presidents as the Society may elect by ballot or otherwise.

3. The Treasurer shall receive all moneys belonging to the Society, and pay over the same on the written orders of the President.

4. There shall be a Finance Committee of three members appointed by the President at each biennial meeting.

5. The Secretary shall, with the assistance of a reporter appointed by him, keep a record of the transactions of the Society for publication.

6. There shall be an Executive Committee consisting of five members, together with the President and Vice Presidents, *ex officio*, five of whom shall constitute a quorum, who shall manage the affairs of the Society during its vacation.

7. Chairmen of Fruit Committees, for every State, Territory and Province, and a general Chairman over all, shall be appointed biennially. It shall be the duty of each of such Chairmen to appoint four additional members of his committee, and with their aid, and such other information as he can procure, to forward to the general Chairman one month before every biennial meeting, State Pomological Reports, to be condensed by him for publication.

8. A Standing Committee on Native Fruits, consisting of eleven members, shall be appointed by the President immediately after his election. It shall be the duty of this Committee to report biennially on native fruits, and also to examine, and before the close of the session report on, all new seedling varieties that may be exhibited; and to make an *ad interim* report on those that were exhibited in an unripe condition at the meeting of the Society, but had subsequently attained a state of maturity; and on such other seedlings as may have been submitted to their inspection during the Society's vacation.

9. A Standing Committee on Foreign Fruits, consisting of eleven members, shall be appointed, whose duties shall be similar to those of the committee in by-law eight.

10. A Standing Committee on Tropical and Sub-tropical Fruits, consisting of eleven members, shall be appointed, whose duties shall be similar to those of the committee in by-law eight.

11. A Standing Committee on Nomenclature, consisting of seven members, shall be appointed biennially.

12. Vacancies occurring in committees shall be filled by the chairman of each, and in case of his death or inability to serve, his place shall be supplied by the President of the Society.

13. The members of this Society shall pay four dollars biennially; and twenty dollars paid at one time shall constitute one life membership.

14. The order of business for each meeting shall be arranged by the Executive Committee.

15. The Constitution or By-Laws may be altered or amended, at any regular biennial meeting, by a vote of two thirds of the members present.

PROCEEDINGS OF THE TWENTY-FIRST SESSION

OF THE

AMERICAN POMOLOGICAL SOCIETY.

CONVENED IN BOSTON, MASSACHUSETTS,

September 14, 15 and 16, 1887.

OPENING SESSION WEDNESDAY, SEPTEMBER 14th.

At 11 o'clock A. M., the Society was called to order in one of the rooms of the Mechanics' Association Building by Mr. W. C. Strong, Vice President for Massachusetts. Delegates were present from twenty States and Provinces, including the District of Columbia.

The following communication was read from the First Vice President:

To the President and Members of the American Pomological Society:

GENTLEMEN:—I sincerely regret that the state of my health at the present moment will prevent me from attending your meeting. More than any other meeting of the Society I desired to be present at this, that I might participate in paying due honors to our late beloved President, and assist in selecting his successor. In all this I am grievously disappointed. Knowing the characters of the members of the Society as I do, I have no fears but that its work will be carried forward without interruption. It is established on a broad and firm basis and has a great and good work to perform. The fruit growing interest of this country has grown to immense proportions, employing a vast amount of capital and labor, and yet it is in its infancy. The foreign demand for our fruits will continue to increase for many years to come—we can supply the world with fine fruits. This National organization is needed to guide this great industry so that it may be both honorable and profitable. This is well understood, and I need not enlarge upon it. Go on, gentlemen, with your good work—no matter who stands or falls, the American Pomological Society must be maintained in full vigor and usefulness. Anything I can do as long as life is spared, will be done cheerfully.

With best wishes, yours,

P. BARRY.

On motion, the Society expressed by a rising vote its regret at the unavoidable absence of Vice President Barry. Hon. P. J. Berckmans, of Georgia, was then chosen temporary chairman. In the absence (on account of ill health) of the Secretary, Chas. W. Garfield, of Michigan, A. A. Crozier, of Washington, D. C., was chosen temporary Secretary.

The Chair then announced the following committees:

ORDER OF BUSINESS—T. S. Hubbard, New York; W. H. Spooner, Massachusetts; G. W. Campbell, Ohio; Samuel Hape, Georgia; J. T. Lovett, New Jersey.

CREDENTIALS—W. B. Philbrick, Massachusetts; Geo. S. Joselyn, New York; N. Ohmer, Ohio.

AUDITING ACCOUNTS—J. H. Bourn, Rhode Island; H. M. Engle, Pennsylvania.

RESOLUTIONS—S. B. Parsons, New York; Robt. Manning, Massachusetts; T. T. Lyon, Michigan.

EXHIBITS AND AWARD OF WILDER MEDALS—F. M. Hexamer, New York; O. B. Hadwen, Massachusetts; P. M. Augur, Connecticut; T. T. Lyon, Michigan; C. L. Watrous, Iowa; Robert Manning, Massachusetts.

Dr. Henry P. Walcott, President of the Massachusetts Horticultural Society, being then introduced, delivered, in behalf of that Society, the following

ADDRESS OF WELCOME.

MR. PRESIDENT:—We do not forget that during all the years of your Society's existence you have honored one of the most prominent members of the Massachusetts Horticultural Society with your highest office. While he looked forward to this meeting with pleasing anticipations, he realized full well the chance that he would be able to be here only in spirit. Yet he hoped, having enjoyed so many of the blessings of Providence, that this also might be added. But he has taken measures—dying, even, that the Society shall forever have at its exhibitions some memorial in honor of his name and of his work. We cannot forget, and you cannot forget, this beneficent providence of our departed associate.

Neither can we forget that the hope which sustained his belief while in the enjoyment of the present, that he was to enjoy forever the promises of the future, was that which made him always young, despite the burdens of his almost fourscore years.

When, nearly forty years ago, the field of pomology became so extended that it seemed to require special workers, this association was formed with the cordial sympathy and support of our Horticultural Society, and it has them still. How well you have done, is shown by your valuable publications. You have done very much in the way of introducing and promoting the cultivation of useful varieties of fruits; you have made great progress, also, in the very difficult task of rejecting useless varieties. Permit me to hope that you will study in the same comprehensive way the causes which have led to the apparent deterioration of some of our fruits, and of the diseases which periodically cause so much destruction.

With the highest appreciation of your work, permit me, in behalf of the Massachusetts Horticultural Society, to bid you welcome.

The biennial report of Secretary Chas. W. Garfield was then read, accepted and referred to committee on business.

Treasurer Benj. G. Smith then made his biennial report; it was referred to the Auditing Committee, which subsequently reported back to the Society that the accounts and accompanying vouchers were found correct. The following is an abstract of the Treasurer's statement:

REPORT OF THE TREASURER.

I present herewith a statement of the receipts and disbursements of the Society for the two years ending September 10, 1887, to wit.:

RECEIPTS.

Balance from old account	$1,226 69
Sixty-six biennial membership at $4 00	264 00
Three Life memberships—Howard A. Chase, R. D. Murray and O. W. Sadler	60 00
From estate of Marshall P. Wilder	5,000 00
	$6,550 69

DISBUSEMENTS

Treasurer's expenses at Grand Rapids	$ 53 30
Stenographer's expenses at Grand Rapids	39 65
W. J. Beal, services as Secretary, 1884 5	100 00
Stamps, cards, circulars and programmes for Grand Rapids meeting	25 09
Cuts of grape blossom for proceedings	4 50
Printing 800 copies of proceedings, F. W. Ball	717 44
Printing 126 copies of fruit catalogue	7 50
C. W. Garfield, services as Secretary	100 00
Draughting bill for incorporation of Society	10 00
Stationery	28 85
Circulars, announcements, etc., for 1886–7	38 30
Postage and postal cards	101 78
Freight and express	14 40
Balance to new account	5 309 88
	$6,550 69

On motion of Mr. Hexamer, the following committee on the nominations of officers was elected, the delegates from each State represented naming the member for that State:

E. F. Babcock, Arkansas.
P. M. Augur, Connecticut.
H. E. VanDeman, District of Columbia.
E. T. Field, Florida.
Samuel Hape, Georgia.
C. L. Watrous, Iowa.
Henry McLaughlin, Maine.
S. T. Jenkins, Maryland.
W. H. Spooner, Massachusetts.
T. T. Lyon, Michigan.
R. W. Starr, Nova Scotia.
A. S. Fuller, New Jersey.
F. M. Hexamer, New York.
J. J. Harrison, Ohio
W. W. Hilborn, Ontario.
W. H. Moon, Pennsylvania.
Charles Gibb, Quebec.
J. H. Bourn, Rhode Island.
T. H. Hoskins, Vermont.
A. L. Hatch, Wisconsin.

A recess was then taken until 3 P. M.

WEDNESDAY AFTERNOON SESSION.

The Society was called to order at 3 P. M. A. S. Fuller, of New Jersey, chairman of the Committee on Nominations, reported a list of persons nominated for officers of the Society for the ensuing term. On motion of Mr. J. T. Lovett, of New Jersey, the Chair was instructed to cast the ballot of the Society in accordance with the recommendations of the committee, which was done. The list of officers appear on an earlier page in this volume.

A committee, consisting of Samuel Hape, of Georgia, and J. M. Smith, of Wisconsin, formally notified the President of his election. On taking the chair, President Berckmans thanked the Society for the honor conferred upon him and earnestly solicited the aid of all the members in maintaining and increasing its usefulness.

Mr. W. C. Strong, in behalf of the Massachusetts Horticultural Society, then announced that in deference to the expressed wish of the American Society no entertainments had been planned for the meeting, with the exception of a banquet the final evening. He read a communication from Mayor O'Brien in behalf of the citizens of Boston, stating that on the 16th a boat would be at the service of the members of the Society should they desire an excursion on Boston Harbor. A message was also received from Mr. H. H. Hunnewell, stating that if it was the pleasure of the Society he would be glad to present an invitation for it to visit his estate at Wellesley. On motion the invitation of the Mayor for an excursion on Boston Harbor, was accepted for 2 o'clock P. M. on Friday the 16th.

The first paper on the programme was then presented:

Suggestions Concerning Imperfect Fertilization of the Grape.

BY

D. S. MARVIN, OF WATERTOWN, N. Y.

Grape vines like other plants, have been subjected to the changes of natural development caused mainly by seismic cataclysms, the varying degrees of solar heat, changes of altitude or local environment. The natural causes have recently been much modified by cultivation. One of the marked natural changes has been toward a separation of the sexual func-

tions. We see this exemplified when we examine the sexual organs, for no one of the fifteen or twenty species with which we have to deal is now perfectly bisexual in all of their varieties. The Delaware is, perhaps, as perfect in its bisexual organs as any variety. Vineyardists have suffered from this tendency to a differentiation of the sexual functions, but the specialist who originates new seedlings observes it most. Our vines have all been selected with reference to their dual sexual organs and functions; but, notwithstanding all efforts for many generations, seedlings still assert a tendency to a final separation of the sexual functions.

This brings me to the point that I desire you to consider. We cannot overcome this natural law of differentiation; then why should we continue to work against a law of nature? Would it not be better to co-operate and endeavor to aid in her lines of activities and see if we cannot find a better way? My idea is to separate the sexes and aid in developing sexual differentiation by cultivating female instead of hermaphrodite plants, with here and there a male plant elevated upon trees or on poles and wires, so that the male plants may run above and fill the air with their pollen to fertilize the female plants below. There would result great economy and saving of vital energy that might be turned to the development of more fruit. As it is now the pollen is more or less impotent, failing to fertilize the ovules, and the emasculated clusters are many. I have already made some experiments upon these suggested lines of activities, and though the experiments have not gone far enough to determine the question, yet they warrant larger and longer continued experimentation.

In the absence of single-sexed vines to operate upon we must utilize such as we possess; perhaps Creveling and Eumelan will answer for female plants as well as any. Delaware and Hartford will perhaps be the best acceptable staminate plants. Better ones may possibly be found in the woods among wild riparia vines. This is doubtless the oldest species of grapes, for it is found upon the gneissoidal strata, our oldest soils; it certainly is the hardiest, for when hybridized with any other it shows its vigor and longevity by dominating the new structures. Its sexual organs are more differentiated or specialized than any other species, the pollen grains being larger, better developed and more prepotent.

As you perhaps know, I am engaged in originating new seedling grapes, which gives me opportunity to see and study this subject. I have already saved a number of separate-sexed vines, and have no doubt of our ability to easily separate plenty of male and female vines. I have not been able as yet to save an exclusively female vine, but I have male vines—the ones chiefly needed at present. True the ovules are still present, but the upper part or stigma is entirely aborted. These vines develop and scatter upon the air a largely increased amount of prepotent pollen.

Two crops a year—one of pollen in the spring, another of fruit in the fall, each of them containing large amounts of nitrogen and other costly germ elements—exhaust the vital energies of the vine and invite the attacks of sporadic diseases. Whatever former conditions may have prevailed, nature seems to be curing those inherent defects by specializing sexuality to avoid this exhaustion.

There will have to be some nice adjustment in blossoming time to accommodate the different species and varieties. Riparia vines blossom too early for most other species; their hybrids will have to be chosen for later kinds. I think that I can already accommodate the early and the medium varieties; those later in blossoming will need other male vines.

The economies subserved will be putting

our practices into a fuller accord with the tendencies of natural development, wherein the functions of fertilization, ovule development and fruit production will all be carried on by the plant in a more natural manner, accommodating sexual tendencies in the direction of a higher order of plants.

The production of pollen as now carried on is burdensome to the plant and exhausts its energies at the commencement of the season, while if this work were performed by separate plants all the energies would be used and utilized for maturing a fuller crop of fruit in the fall, while the male vines would have the whole season to recruit and yield a fuller and more vigorous crop of pollen for the coming springtime. The tendency to a separation of sexual functions is so general in all organic structures, animal and vegetable, that we ought to test its applicability to the vine by selecting and cultivating single instead of double sexed varieties, not acting as if we knew more about her laws than nature herself, or seeming to accuse her of doing vain and idle work. Why are separate-sexed vines developed if we are to discard and throw them away?

Let us compare *Vitis riparia* and *vinifera* in their reproductive organs and functions, their health and vitality. Upon the discovery of America the former was found from Ottawa in Canada to San Antonia in Texas, the verge of the frigid to the border of the torrid zone. The latter was found in the Carolinas, and there only as a hybrid with labrusca. In sexuality riparia is the most specialized species we know of, while vinifera is perhaps the least; one had vigor enough to spread itself over the major portions of the Atlantic seaboard, the other still remaining about its centre of introduction. How will we be able to account for this difference, unless upon the theory of the superiority of single over double sexed vines? True, vinifera was probably a later introduction, but no one knows this to be the case. What is it that has weakened its vital energies so that it seems to be a failing plant all over Europe and the Atlantic seaboard, if we are not to attribute its low vitality to a constant selection of double-sexed plants? Extensive hybridizing with other more northern species of both Europe and America has only proved palliative. The way out of the difficulties seems to lie through a reversal of this practice, of saving instead of throwing away single-sexed vines.

Many viticulturists have studied the causes of failure, and various remedies have been suggested, but no one heretofore seems to have attributed the difficulties to their probable true cause, that of virtually double-cropping the vines, a violation of the laws of natual development.

Since writing the above I observe that the horticulturist of the Agricultural College of Iowa, has been studying this question. He finds that the pollen grains of the male flowers of the wild *Vitis riparia* are about one-fourth larger than the hermaphrodite flowers, and that much of the pollen from the latter is flaccid and will not swell in water, as the pollen from male flowers does. This is because it is impotent. These important studies go to confirm my own views. I do not assert that differentiation of the sexual functions will cure all the ills of the vine, but that a return to nature's methods may restore lost vital energies. Certainly there will be no harm in testing the question by actual experiments in the vineyard. Feeling the task too great for my own unaided efforts, I have come here to lay this question before you and ask you to kindly aid in determining the matter.

The subject has its practical side, even though it may not result in restoring the failing health of the vine. For every one has observed the poverty of the pollen of many of our cultivated varieties, their

failure to set a crop of fruit, and the increase of the crop whenever the stigmas have happened to become fertilized with more prepotent pollen from adjoining vines. I am satisfied that there is no exception in the case of the vine to the great law developed by Mr. Darwin, that plants do really abhor self-fertilization, and that sufficient male vines, elevated above the ordinary vineyard, would prove a paying investment.

T. T. Lyon, of South Haven, Michigan, then opened the subject of Peach Yellows, with the following paper:

The Yellows in Michigan.

The earliest known case, in Michigan, of the disease of the peach tree known as Yellows, is said to have occurred in the vicinity of St. Joseph or Benton Harbor, Berrien county, about the year 1867, in a single tree of Early Crawford, which had been imported from New Jersey, and which ripened its fruit considerably in advance of the usual season of this variety.

This occurred at a time when commercial peach culture, in Western Michigan, was a recent interest, and yet mainly confined to this vicinity; which, however, had already been densely planted with this fruit.

The owner of the tree, ignorant of the existence of such a disease, supposed himself the fortunate possessor of a new variety, all the more valuable on account of its earliness, and darker color. It at once attracted general attention; and the tree is said to have been literally cut to pieces, to supply buds to the orchards and nurseries of that region.

The result was, the rapid and well nigh universal diffusion of the disease through the orchards of that vicinity; and when, as was soon the case, the real nature of the calamity began to dawn upon the minds of those interested, resort was had to various supposed preventives or cures, with the result that, in very many, if not in most cases, entire orchards became diseased; and, within a very few years, the peach growing interest of an extensive and densely planted region was utterly swept away.

The fact of the adaptation of portions of Van Buren and Allegan counties, lying further north, to the cultivation of this fruit, was a later discovery; and when, about 1873 or '4, the disease was first discovered in Western Van Buren, twenty miles north of St. Joseph, planters here had taken warning by the experience of St. Joseph, and resorted promptly to the process of cutting out and destroying the affected trees as soon as the disease was discovered. The result of the careful and thorough carrying out of this process has been the apparent eradication of the disease in some orchards.

In cases in which this process has been less carefully and thoroughly applied, and in orchards contiguous to wholly or partially neglected ones, the disease has usually maintained a more or less restricted but continuous existence, commensurate, apparently, with the thoroughness of the efforts for its extinction, and the nearness or amount of exposure from without.

As with the early experience about St. Joseph, so elsewhere, the omission to apply this remedy seems to have been invariably followed by the early and utter ruin of the orchard.

These experiences have had the effect to call the earnest and general attention of planters to the disease; and the evidences of its contagious character have been so numerous and convincing, that, in the peach growing portions of our State, very few planters question its contagious character. We have known persons who, doubting this, have spared their affected trees, till the fruit could be ripened and disposed of; and yet others

who have removed an affected branch or branches, retaining the apparently healthy portions; but, in all such cases, the disease has rapidly spread or increased, and passed beyond the possibility of control, save by the entire destruction of the orchard.

With a better knowledge of the disease, coupled with the very general assurance that the heroic remedy already mentioned is the surest, if not the only effective means of arresting it, the more recent spread of the disease northward, along what is known as the "peach belt," has been comparatively slow. Although it is now twenty years since its appearance in Berrien county; and perhaps fourteen or fifteen years since its appearance in Van Buren—the next county northward; few, if any cases are known to exist northward of Kent county—a distance of perhaps sixty miles from its original starting point.

At South Haven, Van Buren county, where this cutting out and destroying process was first practiced in Michigan, the neglected orchards have nearly or quite disappeared, the ratio of annual loss from the disease has very considerably diminished, and the acreage of peach orchards is rapidly increasing. The same may be said of Allegan county, and of the entire commercial peach growing region further north; while the original source of the contagion has now become nearly or quite purged of the disease, and is again planting the peach freely.

The disease is believed not to exist in the central and eastern portions of the State. In fact, although, throughout the more southerly portions of the lower peninsula, locations exist, adapted to the successful growing of this fruit, they are so generally isolated from each other, that little danger may be supposed to exist of any atmospheric transmission of the disease from one to another.

Soon after the disease had manifested itself beyond the limits of Berrien county, legislative interference was invoked to provide protection against its inroads; and a law was enacted, which declared diseased or affected trees, as well as fruit, to be void of pecuniary value, and dangerous sources of contagion; and prescribed proceedings for their immediate destruction as dangerous nuisances. In the commercial peach growing regions, public sentiment was so far prepared for this step, that the requirements of such law had very generally been voluntarily fulfilled, and the cases calling for the forcible execution of the law, if any, have been exceedingly rare.

To a person familiar with the manifestations of the disease, the liability to mistake is very slight; if, in fact, such liability can be said actually to exist. While under neglect or starvation, trees may often be found making feeble growths, with pale, sickly foilage; these are so radically distinct from the indications of genuine Yellows, and yet so perfectly correspond with occasional published descriptions of it, as to create the impression that the writers may have mistaken the results of the attacks of insects or of starvation for the genuine symptoms of this disease.

There has been no lack of persons, among us, who have held that the disease is the result of starvation; and, in addition to the ordinary processes of fertilization, various secret remedies have been offered; all, however, proposing the use of fertilizers, special or general, as the means of cure.

If the microscopic examinations and experiments of Professors Burrill and Arthur have not, in fact, demonstrated that the disease is due to bacteria in the circulation, they have, at least, so nearly approached such demonstration, and observed facts so perfectly coincide with such assumption, that it becomes difficult to escape their conclusion. The neces-

sary inference from this must be that these organisms subsist and increase upon the means of growth supplied through the circulation; thus robbing the tree of the material needed for its continued health and prosperity. Such being the case, the result must necessarily be as observed: the tree gradually fails in growth, owing to this clandestine absorption of the needed material. The application of manurial substances, for whichever purpose applied, while supplying this deficiency, and hence renewing the vigor of the tree, at the same time supplies the means of increase to the bacteria. It obviously, therefore, becomes a mere question of the time when the latter shall become the dominant consumer, the manurial remedy overridden and the contest ended by the death of the tree from starvation; it meantime acting as a propagator and disseminator of contagion.

The earliest manifestation of the disease may usually be discovered in the fruit, which becomes prematurely ripe, darker in color, and lacking in flavor; the pit and the flesh being very much darker than usual. This manifestation may occasionally be discovered upon a single branch, or even in a single fruit; while the remainder of the tree is apparently in perfect health; but, that this circumstance must be held to be deceptive, appears from the too common fact that, no matter how promptly such affected fruit be removed, the disease is found too surely to manifest itself in the remainder of the tree, at no very distant period.

The second indication of the disease, which, in the absence of fruit, not unfrequently becomes the first, is manifested in the slender, wiry growths and weak, feeble foliage, which usually appear at the basis of the branches, and upon the older wood. While such growths are more noticeable, where they occur in such positions, and upon less vigorous trees, they are by no means confined to such, being often known to appear upon trees in apparently vigorous health; which appearance however, is never found to continue beyond the year in which the disease is thus manifested.

The probability of the correctness of the assumption that the bacteria accompanying such disease are, in fact, its cause, received strong confirmation to the minds of many of our Western Michigan fruit growers, from the examinations and observations of Prof. Manly Miles, formerly of the Michigan Agricultural College, and more recently of Amherst, Massachusetts; who, last year, spent some time in that region, in the microscopic study of the disease.

His examinations developed the fact that prior to its manifestations, even in a single fruit, twig or branch, bacteria had, to a greater or less extent, become disseminated throughout the circulation; while they were wholly absent in manifestly healthy trees.

These alleged facts, if admitted to be such, seem to strongly emphasize the consideration that no proposed remedy or preventive, short of the heroic one heretofore practiced, should be trusted; unless by possibility, it shall be found capable of permeating the entire circulation of the tree, and destroying these nefarious organisms, without essentially injuring the tree itself.

W. C. Strong, Massachusetts: I have had success in treating the Yellows with potash. Is it not reasonable that if we give vigor to a plant it will be more able to resist the attacks of disease-producing organisms?

A. S. Fuller, New Jersey: I have been trying for thirty years to make the Yellows grow on my grounds. I have introduced it time and again, but by using plenty of potash it has never spread to other trees. Mr. Downing sent me, at my request, buds from trees having the Yellows, but the trees I grew from the

buds were all healthy. I have frequently observed trees which were said to have the disease known as Yellows, but upon examination I have found them dying from either starvation or parasites.

T. T. Lyon: Trees on our richest soils in Michigan take the disease just as readily as others. Trees in the most vigorous growth one year may have the disease the next and be entirely killed.

J. C. C. Hyde, Massachusetts: I have made a study of the Yellows for many years. I was humbugged years ago just as they were in Michigan, into introducing the Yellows, thinking that I was getting a new early variety. I have found that trees in vigorous growth, heavily manured, are sure to go with the Yellows. I calculate that we will get only one crop from trees which make an excessive growth. Trees which stand in grass land and ripen their wood well, remain healthy for twenty years or more and produce successive crops of fruit. I have used with good success unleached wood ashes for the Yellows. I have applied a large quantity of ashes to trees struck with the Yellows, and in some instances the disease has wholly disappeared, in others nearly so. I intend to plant my next orchard on the north side of a hill, fertilize with ashes, but secure only a moderate growth, so that the wood will ripen well.

T. C. Thurlow, Massachusetts: I have been for twenty years trying to raise peaches. My last orchard of 500 trees did well for several years, when I found a few trees going with the Yellows. I dug them up or cut them down, and applied lime, but the Yellows spread until I lost the whole orchard. I have found muriate of potash an excellent fertilizer for peaches, and animal fertilizers very bad. The latter causes them to winter-kill if nothing more.

A. S. Fuller: The soil at my place is a deep sand which has been in cultivation a hundred years. I get a good growth only by feeding. I use potash, a little salt, and old manure.

J. A. Lintner, New York: In many of the Southern and Western States the Yellows is still unknown.

Mr. Starr, Nova Scotia: I think the main secret in avoiding the Yellows is in having the wood well ripened. We grow peaches on a small scale, and try to secure a good growth early in the season.

H. M. Engle, Pennsylvania: So far as I have seen, it makes no difference in its liability to the Yellows whether a tree is a rampant grower or a weak grower. Several years ago I bought a few trees and budded from them, and the budded trees nearly all had the Yellows, though the trees from which the buds were taken did not show the Yellows when the buds were cut. On another occasion, I budded from a tree that had not a sign of Yellows, and the young trees the first year showed the disease. I think the cause is not in the exhaustion of the soil; among trees growing side by side on the same soil some will have the Yellows and others not. I have noticed that the disease could always be traced to one or a few trees from which it spread.

D. Baird, New Jersey: Last October New Jersey was very dry; then there was a change in the weather which checked or killed the young growth. This year many of the trees show what seems to be Yellows, in having prematurely ripened fruit.

The Secretary read a letter from Mr. Erwin F. Smith, agent of the Department of Agriculture, who was investigating the Yellows in Delaware. No cause was yet determined upon, but there had been much increase in the disease during the last two wet seasons.

The next subject was opened by the following paper from J. J. Thomas, of Union

Springs, N. Y., which was read by W. C. Barry:

Nomenclature

The Science of Pomology—the systematic study and description of fruits—has for the objects of its investigation a most perfect union of the useful and beautiful of vegetable products. It is therefore eminently fitting that the science should preserve in its language the purity and dignity which it properly merits. The American Pomological Society, the most extensive and successful organization of the kind in existence, has therefore an important vocation in preserving in its nomenclature a character for accuracy and truth.

An essential part of the work of the Society is the establishment of correct names for the many hundred fruits which come before it for examination and for adoption in its select Catalogue. Without correct nomenclature, the public is liable to be continually imposed on and misled, the reputation of fine varieties to be seriously damaged, their successful introduction and culture retarded, and the business of the commercial fruit grower mixed with confusion and loss. Next to correctness in names, is the employment of those which are appropriate and descriptive, and the rejection especially of all those which are coarse and laudatory, a fault into which the originators or introducers of new varieties very often fall. Pomology, which should always have the accuracy of a natural science, should not allow the use of names of new fruits to degenerate into peddler's puffing, but on the contrary should be infinitely remote from such degredation.

It often happens that a new fruit succeeds best in the locality of its origin, and under the high culture which it receives while yet rare and new. The disseminator adopts the unwise course of giving it a high-sounding name, hoping that every time it is repeated in reports and in catalogues, it will thus receive additional advertising without cost. If it is widely disseminated, the thousands who cultivate it are thus compelled to aid in praising its merits, even if it has none, every time they pronounce its name. But the intended purpose of its owner is likely to be defeated, for the impression is conveyed to intelligent persons that the owner distrusts the real merits of the variety, and hopes to aid its doubtful character with a bombastic cognomen. Such fruits of established character as the Baldwin among apples, and the Bartlett and Seckel with pears, have never required any spurious aid to help them along. On the other hand the lofty title of King of the Pippins and Batchelor's Glory among apples, and Knight's Monarch and Hacon's Incomparable among pears, have not given to the fruits they represent a wide adoption, and some fruit growers have not even heard of them. Many of our modern sorts of high laudation will probably be consigned to the same oblivion, after they have enabled the owners to make an extensive and profitable sale.

The two leading aims which should be kept in view in giving names to fruits, is to select such as are appropriate, and neat and compact. They may be descriptive of some quality, give the place of their origin, or have the name of the originator. In the names of peaches, for example, such simple and descriptive ones as Lemon cling and Nivotte are to be greatly preferred to "Admirable" and "Incomparable," which have been given to certain nearly worthless sorts. Among strawberries, the old names Crimson Cone and Neck Pine are better than Wizard of the North and Napoleon the Third. Many new varieties of the strawberry have been given names which the American Pomological Society cannot adopt in accordance with its established rules. A large

number have appended the word "prolific," requiring every person who names them to announce to the world that the owner regards them pre-eminently productive, and intends that all who name them shall aid in praising their admirable bearing qualities. They may be improved by leaving off the objectionable word from Neunan's Prolific, Finch's Prolific, Miner's Great Prolific, and others, as well as from such superlative titles as Nigh's Superb, Golden Defiance, Great American, Arnold's Pride, Cumberland Triumph, and Durand's Superb. A new peach has the single name "Wonderful," and a new raspberry "Superb," neither of which is appropriate and truthful. "Stump the World" is an unsuitable name for even a very fine peach, and "Empire State" for an excellent grape. Raspberry growers have the Golden Queen, the Marvel of our Seasons, and the Pride of the Hudson. It is but justice, however, to make the passing remark, that the English have rather exceeded the Americans, so far as producing in their prize gooseberries the "Green Ocean," "Wellington's Glory," and "Roaring Lion."

Needless appendages should always be avoided. There are more than 250 names of pears with the word "Beurre" prefixed —a word which will apply so far as the meaning goes, to nine-tenths of all the named varieties; and it is not necessary to require the thousands to write this sterile name every time they have occasion to refer to any of them.

The name of a fruit should in most cases consist of a single word; and hence the simple word Miner is much better for the strawberry than Miner's Great Prolific; Cumberland is better than Cumberland Triumph; and we may properly change Barnes' Mammoth to Barnes, Duchess of Oldenburg to Oldenburg, Bigarreau Mezel to Mezel, Tewksbury Winter Blush to Tewksbury, Miner's Great Prolific to Miner, Hubbardston Nonesuch to Hubbardston, Shaffer's Colossal to Shaffer, Reine Claude de Bavay to Bavay and Bonne du Puits Ansault to Ansault.

There are occasional instances where double names are quite admirable, such simple ones,for example,as Summer Rose, Willow Twig,Ben Davis,Red Stripe,Jersey Sweet, Fall Pippin, Maiden's Blush, and other names of apples; and Sugar Top, Winter Nelis, Saint Germain, Little Musk, Long Green, Swan's Orange and Green Chisel and others among pears.

We may not desire to engraft the titles of foreign aristocrats and dignitaries on the sorts we cultivate, and we may therefore properly abridge Duchesse d'Angouleme to Angouleme, Duchess of Bordeaux to Bordeaux, Duchess of Orleans to Orleans, and Duchess of Brabant to Brabant. For a similar reason we may object to May Queen and Jersey Queen, Grand Duke and Prince of Berries, for strawberries; Amber Queen among grapes; Queen of the Market among raspberries; and we should reject such coarse names for so beautiful and refined a fruit as the strawberry, as Jumbo, Big Bob, Black Giant and Capt. Jack.

The last topic of the afternoon was then taken up.

Influence of Cross-Fertilization on the Fruit.

BY A. A. CROZIER.

Most of those who have given attention to this subject believe that there is such influence. Darwin in his "Animals and Plants, Under Domestication," (vol. 1, p. 476) gives a large amount of evidence going to prove that such is the case. But he says that such an effect does not always follow, and that Mr Knight, a careful observer, had never seen the fruit affected, though he had crossed thousands of apples and other fruits. Dr Gray says: "It is generally agreed that the alteration of the character of the fruit is

immediate, *i. e.*, that it affects the ovary itself." In a review of some experiments by a French investigator, Mr. Nandin, on cross-fertilization, in the Cucurbitaceæ (Jour. of Science, sd. ser. v. 24, p. 440) he says that the fact of even an influence of squashes upon melons the same season seems to be well authenticated.

Mr. Meehan, after publishing much on this subject in his Gardener's Monthly, reviews the whole question in an article in the Rural New Yorker (1885, June 13 and 20) and concludes that there is not sufficient evidence to warrant a belief in the direct influence of pollen, except possibly in the case of Indian corn.

The greatest amount of interest in this country on this subject has been in connection with the strawberry. The custom of planting pistillate sorts to be fertilized with staminate varieties has rendered the question of there being any influence on the fruit from this source an important one. Most growers who have observed the matter believe that there is such an influence, at least at times. At the last meeting of this Society, two years ago, there was a long discussion on the subject, in which experiments at the Ohio Experiment Station were reported, which seemed to show conclusively that the fruit of the strawberry could be changed in character by using pollen from different varieties. A second set of experiments the following year, however, it was stated gave less definite results. The same subject was taken up at the New York Experiment Station and the results gave no evidence that pollen had any direct influence

To obtain further evidence on the subject I last year planted some sweet corn in the midst of a field of dent As soon as the tassels on the sweet corn appeared, and before any pollen was shed, they were all removed, so that the evidence of a cross was conclusive The resulting ears were uniform in appearance, with yellowish kernels, neither dented nor wrinkled—showing that in corn at least there is an effect the first season. The case of corn and other grains, however, is peculiar in the fact that the ovary or fruit is merely a thin skin investing the seed, so that the influence here may have been only upon the seed, as is known to be the case in all crosses.

To further test the matter I this year planted two varieties of Summer squashes, white and yellow, and cross-fertilized both ways, but found no influence on the fruit. At my request Mr. F.E. Skeels, of Grand Rapids, Mich., planted some of the same lot of seed, cross-fertilized in like manner, and obtained the same results. (Ag. Science, vol. 1, p. 228) Prof. L. H. Bailey, of the Michigan Agricultural College, has this year made experiments in the same line, and writes as follows:

"I have performed many crosses this year, and between such plants that would give unmistakable evidence of the immediate effect of pollen, should such effect occur. I crossed Hyslop Crab with Duchess of Oldenburg, and got no effect in any way, not even in season of maturity or texture. I crossed another Crab with Sweet Romanite and obtained no immediate effect. By the way, I made a singular incidental experiment on these varieties. Of five crabs I removed four of the pistils and crossed the remaining one From these crosses I got two mature apples, but they had seeds in only one cell! I crossed many Crook Neck squashes with the White Scallop or Summer Turban. The squashes are now nearly matured, but there is no immediate effect whatever. In order to test the matter more fully I hybridized two plants, which have exceedingly dissimilar fruits. These are Datura Stramonium and D. inermis. The former has very prickly pods, the latter has very smooth ones. I have made reciprocal hybridizations, but there is no

immediate effect of pollen. I have never yet seen any immediate effect of pollen. I am very careful in making my crosses, and I know that I have made no mistake. I do all the work myself. I use manilla bags on both the pistillate and staminate flowers, and I leave them on the pistillate flowers a week after the operation is performed."

E. S. GOFF, New York: I performed an experiment on the subject with some Crescent strawberries on which I could find no stamens. They were placed in three sets in a green-house and covered with mosquito netting. One set was fertilized with the Wilson, another with Sharpless and the other with Leaming's White. No difference was observed in the berries in the three cases.

WEDNESDAY—EVENING SESSION

The Society was called to order at 7:30 o'clock by President Berckmans.

The first subject was:

Climate as Effecting Color in Fruits.

BY DR. E. D. HALSTED, AMES, IOWA.

In considering the influence of climate upon the exterior (and interior) color of fruits it is necessary first to look at the probable origin of color in flowers. The bright and beautiful hues in blossoms were probably brought about for the purpose of attracting insects. These insects were rewarded for their attentions by sweet sips of nectar, while the indulgent plants took advantage of the visits of the insects and secured at the same time the transfer of pollen from one flower to another. No one is able to explain just why one species has showy white flowers and another a blue or yellow color. Of two species of Lobelia growing side by side in the moist meadow, one has large cardinal flowers while the other bears blossoms of a deep blue color. Similar in nearly everything else, they are strikingly unlike in point of color.

Geology teaches us that the early forms of vegetable life were without flowers, but later on in the evolution of plants, blossoms of a rudimentary sort were produced. As time passed—long ages of time—these blossoms became more complex, and colors doubtless developed in them according as they were an aid in attracting insects. The visitation of the insects secured cross-fertilization, and before a body of pomologists it is only necessary to fall back upon cross-fertilization, with all its well attested points of superiority over self-fertilization, to rest upon safe and solid ground. In short, the botanist of to-day assumes that any display of color in floral parts and all fragrance of the same were primarily developed by the ancestral plant under the stimulus of certain attendant insects, and for the special purpose of securing a quick and economical transfer of pollen from one flower to another. What gardeners may do with these same plants, at the present day, in the line of "doubling" the blossoms, robbing them of their odor, or introducing a thousand variations and combinations of the old original colors, it is not for me to say. Let us bear in mind that the origin of any particular color in the early flowers of a geologic plant was seemingly by accident, and the preservation of that color is due to the ancient insects, the eyes of which were attracted by the color In this way the first faint shade of azure in the Blue Lobelia became of service to the plant thus favored, and by law of the survival of the fittest the color deepened in the offspring until

it is now as much a part of the species as the shape of the corolla—which latter doubtless underwent many modifications before it arrived at its present complications, and all under the influence of the insect attendants. In like manner, if we consider the cardinal Lobelia, we will find that the seemingly accidental starting point was a reddish hue which deepened as fast as a deeper shade was found of advantage and became perpetuated in the offspring of those plants which were the better able to survive.

The point has been dwelled upon to show that, as far as floral colors are concerned, the determining forces are subtle ones and only indirectly influenced by climate. Flowers of nearly all shades of color are to be found in nearly all parts of the world where vegetation abounds. It needs to be borne in mind that plants, like animals, are plastic, living things, struggling under two sets of seemingly antagonistic forces. One set would make the offspring an exact reproduction of the mother plant. The other set carries with it the element of change. It is to this last group of forces that we are indebted for the wonderful variety which we see everywhere. It is to this last that we may be grateful for the golden thread of adaptation which runs perplexingly, and yet always with deepening interest, through the woof of all created things.

As we come nearer to the subject in hand we need again to look back into the past, long ages before man wrote history, and inquire for the origin of color in fruits. We must first consider the wild fruits and speculate upon the probable methods by which their surfaces became bright colored. As the floriculturist has been able to greatly change the floral display of plants, so the fruit grower has modified the appearance of the rich and juicy subjects under his charge. But in both cases and with equal force, it may be said that without the wild plants and their acquired qualities and tendencies, nothing worth our thought would have been recorded. We may cast our eyes along the almost endless rows of dishes of pears, apples, peaches, plums and other fruits at our annual exhibitions and claim with pride that these, in all their beauty and variety of form and color, are the work of our hands. The workmanship is attractive beyond measure, but in all our exultation let us not forget that the foundation was laid for us long before the first pair stole apples second hand in the garden of the Lord.

The sole object of flowers is the production of seed, and a seed is a young plantlet which only needs the necessary conditions to be supplied when it will grow into a structure similar to the mother plant. As far as it concerns us at present, seeds are borne within a wall or covering, which may be thick or thin, dry or fleshy. The covering and its contents are together called a fruit. Next in importance to the production of seeds is their dispersion. They need to be transplanted to a suitable place for germination. To this end there are many contrivances. Some kinds of seed vessels become dry and tense and will suddenly split and throw the seeds, sometimes for several feet. Other dry fruits, like those of the Maple and Ash, have broad, thin expansions by means of which they are carried long distances by the wind. In a similar manner the Thistle and Dandelion seeds float in airy balloons over land and lake. Many fruits have hooks or barbs by which they cling to the hair or wool of passing animals. All of these kinds are fruits without conspicuous colors. The class which specially interests us has hard seeds surrounded by a soft pulp which often abounds in sweets and bright colors. The Cherry may be taken as an illustration. A single seed is surrounded by a stony covering inclosed within a rich juicy pulp, and over all is stretched a firm, bright-

colored skin. The whole forms a most tempting morsel for a bird, as every cherry-grower knows too well. The young seed-plant is safely imprisoned within the stony covering and may be carried a hundred miles from where it was produced, and then dropped in a favorable place for future development. The outer, rich pulp and the inner, indigestible stone were as certainly made for the purpose of seed distribution, through the agency of birds, as were the wings of the maple seeds, the thistle balloons or the burs of tick seeds, beggar's lice, cockle burs, etc. With the strawberry there are many scores of small seeds with hard coverings scattered over the exterior of a fragment and luscious, fleshy receptacle. In like manner the blackberry, raspberry, black-cap, and other berries are aggregations of hard seeds, each with a soft rich enveloping pulp. The purpose of the plant is best served when such fruits are eaten by birds, and were not this so, there would be no such expensive provision for carrying out the plan of seed dispersion along the adopted line. If we review the history of the development of a cherry it will be seen that at one time insects visited the fragrant, showy flowers and secured the fertilization of the young seed. Several insects may have taken part in the work. Later on, after the fruit had ripened and the exterior became painted with a showy color, a bird—probably not more than one, for even birds do not, as a rule, "take tid bits at a cherry"—carried it away from the branch on which it grew. The insects did their work when the cherry tree was like a great giant boquet of blossoms. They carried pollen while they went honey gathering. The bird dispersed the seed and took the soft lucious pulp, as the stipulated pay in that great unwritten code of natural laws which cherry trees and robins both understand—the orchardist with his scare-crows and loaded shotguns notwithstanding.

We have seen that it is not easy to determine why certain colors have developed in the flowers of certain plants. We know from repeated experiences that a very small circumstance at the outset may determine the course of even so great a thing as a mighty river. It cannot be stated, in precise terms, why red raspberries are red and blackberries are black. To say that with the former the prehistoric plants found red, was most favorable in the struggle for life and therefore plants with other colored berries fell behind in the race, while the blackberries, took another line, employing other insects—to say this, is not stating as much as the lover of matters of fact might desire. But this is doing about as well as when we try to explain forms and structures in any branch of organic life. If we attempt to account for the peculiarities of our own nose or face we arrive at the result through the same channel of reasoning.

It is safe for us to assume that for a particular species of plant under the circumstances existing during its development the results are in harmony with the surroundings. We are all willing to grant that plants, like animals, are inclined to adhere closely to lines of least resistance, but we sometimes fail to recognize the fact that there are a vast number of these lines, and the one adopted for one species may differ greatly from that of another.

It seems to me that enough has been said to warrant the conclusion that the color of our wild fruits has been developed in much the same manner as that stated for flowers. With blossoms the insect pollen bearers have been the chief stimulus and modifiers, while with fruits the birds and other fruit-eating animals have been the leading factor in determining the ultimate color or combination of colors. If this be true, and it is the accepted view of botanists, it follows that our subject is much narrowed, at least, so far as our wild fruits are concerned, and

as these are the foundation of cultivated fruits, climate must play only a secondary part in determining the color of fruits.

Climate doubtless did exert an influence in developing color, but largely through its shaping the distribution of insects over any given area of the earth's surface and also by furnishing the medium of sunshine, air and moisture, through which colors arise. Climate embraces a consideration of temperature, moisture and winds, and it is easy to see that in this broad view climatology is a subject which touches all forms of life, and at many points. Heat and cold alone are barriers between the extremes of which life is hedged about as by a wall. In like manner moisture and dryness say to vegetation thus far and no farther. The rainless desert forbids the growth of land plants upon the one side and the ocean has its shore line upon the other. Climate reaches back of all forms of life, and, in a general way, decides what those forms shall be for any particular locality. The vegetation of the tropics in all its perennial richness, wealth and vigor is not suited to the long arctic night, and the dwarfed herbage of the polar regions could not sustain itself on the banks of the Amazon. Even in our own country one only needs to cross the continent to appreciate the variety of climate we possess. The lines of equal temperature do not keep company with the lines of latitude. Oceans, mountain ranges, prairies, plains and deserts, all combine to produce a variety of temperature and rainfall that presents a serious unsolved problem in the hands of our climatologists. When I think of one large part of our country being an arid waste covered with sage brush and sand; another, a mountain range with peaks capped with perpetual snow; another, a treeless billowy sea of waving grass swept by winter blizzards and summer cyclones, while other areas are alternately drenched by floods and cursed by long continued droughts—when we think of these and the thousand things which follow in their train it is not strange that no time has been left for the careful, systematic study of the effect of climate upon the color of fruits.

Those whose names would stand as authorities upon such a topic are almost silent. Mr. Barry in his "Fruit Garden" (page 64–75), says: "The color of fruits depend much on their exposure to the sun's rays. We find that in orchard trees where the heads are dense and a large portion of the fruit shaded and shut out from the sun, there is a great difference in the color, indeed, so great frequently as to make their identity from appearance quite doubtful. Varieties that are naturally, when properly exposed to the sun, of a bright red or a glowing crimson, remain green in the shade. The climate, too, seems to have considerable effect on the color. As a general thing we observe that Northern apples are cleaner and brighter than those of the South. Dry soils and elevated situations produce more highly colored fruits than deep and low valleys. * * * * * The same circumstances mentioned as favorable to the production of fine flavor. Light, heat, a dry soil and moderate growth seem to be all essential to a fine flavor." It is a matter of common observation that large fruits, like apples, which have been partly shaded by a leaf lying close upon the surface will have the covered portion of a different color from the exposed part, and usually there is an absence of color. The process of "sun printing" is only an ingenious advantage taken of the influence light and shade have upon the surface coloration of fruits. Cover all parts of the fruit except the letters and they will be printed red or some other high color. Leave all the surface exposed except the letters and when the cover is removed from these they will be pale upon a bright background. There is frequently

a bright and dull side to each fruit upon a tree, and these correspond to the sunny and to the shady sides. In this discussion we need to bear in mind that the surface color of fruits is often not more than "skin deep." The richest blush of the ripe peach may be removed with the thin film of epidermis. Chemists are inclined to the belief that all the many hues in plants may be reduced to four fundamental pigments, the leading one of which is the standard green (chlorophyll) of ordinary foilage. White, for example, is considered due to the reflection of light, through colorless tissues containing air. Orange is due to the dense deposit of the yellow pigment. Blue and voilet are derivities of the primary, red. Black is only a concentrated violet. Fruits in ripening pass through various shades of color from green to yellow or red, and from red to purple or black. These changes of color are accounted for by the decomposition of the green pigment, with the formation of new colors, or the masking of yellow previously dominated by chlorophyll.

That these changes are not always dependent upon the presence of light is well established. Experiments with flowers, for example, have shown that so long as nourishment in abundance is furnished by green leaves exposed to sunshine, the blossoms developed of normal size and color in deep darkness. In like manner many of our fruits are grown with partial exclusion of light, as for example, in accordance with the highly approved practice of placing sacks over clusters of grapes. The writer has kept thick sacks upon apples, which had resulted from cross-fertilization, until mature and the fruit suffered no loss in color.

The consideration of light may be, perhaps, thought by some as a digression from the subject. But light and heat are from a common source, and so intimately associated that it is impossible to decide how much of the color influence should be ascribed to each. It is, however, reasonable to conclude that, all other things remaining the same, the more of exposure to the sun light, the higher the color of any particular fruit.

Lindley in his "Theory and Practice of Horticulture" (second edition, pages 100-101), states that if there is a lack of heat, the flavor, sweetness and nutritive matter of fruits is reduced. Fruits produced without artificial covering are much deeper in color than those which are developed under glass in highly heated buildings, where fresh air has little access. Some fruits require a high summer heat and this is probably the reason why fruits of high color in regions of extreme summer heat and dryness are inferior in climates with less heat in summer. To quote Mr. Lindley's own words: "Among the immediate causes of the changes that occur in the secretions of fruits are heat and light, without which the peculiar qualities of fruits are imperfectly formed, especially in species that are natives of countries enjoying a high Summer temperature. It is found that among the effects of a high temperature and an exposure to bright light is the production of sugar and of certain flavors; and that under opposite circumstances acidity prevails. * * * * It is certain that all vegetable secretions, of whatever kind, are improved in quality when air has the fullest access to plants. Of this we have abundant proof when we contrast the pallid sub-acid pine apples of forcing houses with those ripened out of doors—or when we compare the brilliant colors and rich perfumes of flowers and fruits formed in thoroughly ventilated hot houses with the same productions taken from glass houses to which the air has very little access." The importance of abundant fresh air for the proper development and high coloring of fruits is sufficiently understood to not require further treatment here. We only need to bear in mind that wholesome air is an aid in painting the red upon the

cheek of the peach or the blue upon the surface of the plum.

Soil also has its influence upon the color of fruits. Prof. Tracy[1] says: "Certain conditions of soil and climate result in variations which become permanent, even when the plants are removed to other conditions. If wax beans are planted on soil deficient in vegetable matter and the plants suffer from want of water, some of the plants will produce pods having a decided color." In another case Professor Tracy wished to secure a stock of white Summer crook necks. From a large stock of yellow crook neck seeds in which there were no white spots, he planted a quarter acre on a quality of soil which experience taught yielded the whitest fruit. As a result he had a few plants with white fruit. The seed from these yielded the next year (1885) a crop half of which was white crook neck. In like manner differences in soil conditions influence the qualities, including color, of the fruits of our orchards. Of course it is not understood that a car load of soil brought from a flourishing Florida orange grove to the banks of the Hudson will permit the growing of citrus fruits, out of doors, within the sound of the church bells of New York city. The vine clad and seemingly almost poverty-stricken hills of Europe will produce wine that sells for ten dollars per gallon, while the rich valleys in sight may yield a vintage having no market among the wealthy judges of wines. Striking differences in the quality of a variety of fruit may exist even in the same soil and under the same conditions. This is a sort of "personal equation," a peculiarity of the tree, and for the present may be left out of sight. But in the case of the squashes and of the vineyards mentioned above, it is a soil influence in some measure at least.

In order to arrive at some figures upon the colors of our fruits, twenty of the varieties of peaches in the last "List of Fruits," of this Society (Report of 1885), were selected for the Northern States and twenty for the South. The choice was made upon the basis of the number of stars. Of the twenty most popular in the North, thirteen were white, seven yellow and two green. The favorite Southern sorts were distributed as follows: Yellow nine, white seven, green four. It will be seen that there are nearly twice as many white sorts in the Northern twenty as in the South, and only little more than half as many yellow varieties. Taking ten varieties of plums in the same way: for the North—green four, yellow seven, red four, and purple five; for the South—green three, yellow five, red seven, purple five. Nearly all the plums are recorded with two colors, as green and yellow or red and purple. In making the summary each color is counted separately. It will be seen that with the Northern sorts yellow led, while with the Southern varieties red was ahead. By taking twenty varieties of pears it was found that for the North there were nineteen with yellow, twelve green and five red. In the Southern list twenty yellow, ten green and eight red. In other words, there was for the South less green, more yellow and much more red than for the Northern sorts. With grapes it was found that the so-called white (green) sorts are not standard in the South. A somewhat different basis of comparison was taken for the apples. Twenty of the most popular varieties for the whole United States were selected. Of these, fifteen are leading sorts in the North and ten in the South. The fifteen are divided into: Three with red, six green, and eleven yellow. This gives greenish yellow with a tinge of red as the typical Northern color for apples. Of the ten for the South, six have red, three green, and nine yellow. The typical color is therefore reddish yellow with a small mixture of green.

With currants the record shows that

[1] "Variation in Cultivated Plants," in proc. of 6th Meeting Soc. for the Prom. of Agl. Sci., pp. 16 17.

white sorts are much more the favorites in the North than South. Gooseberries are not extensively grown South, but red are more successful than green sorts. A comparison of ten sorts of strawberries shows more scarlet in Southern than Northern berries.

All of these several results point in the same general direction, that is, the color of fruits grown in our "Southern Division" as laid down in "Catalogue of Fruits"—namely between latitude 28° and 35°, are more highly colored than those which flourish best in the "Northern Division," namely between latitude 42° and 49°. Take, if you please, two popular sorts of apples, which stand close by each other in the list—the Baldwin and the Ben Davis. The former is a redish-green winter apple, double starred for nearly every fruit growing State north of Illinois, but in the South it has only one star, and that is for Alabama. If those early-ripening apples of Alabama were placed by the side of the hard, long-keepers of Rhode Island the contrast would be striking. The "Ben Davis" has only four stars (singles) for the Northern division, while south of New Jersey it has not less than seventeen double stars, including South Carolina, Georgia, Indian Territory Louisiana and Texas. The color of this popular fruit is a combination of yellow and red. "Carolina June" is another sort which has the same range as "Ben Davis," and very popular. This is a summer red-striped sort. The "Greening" is a leading Northern fruit, which change its greenish-yellow for yellow as it goes South and West from its home in New England. In the South it has no merit.

These generalizations from well established tables have their faults, but they accord with the statements made by some of the authorities upon such subjects. My colleague, Professor Budd, who has given a good part of his life to a study of the influence of climate upon the hardiness of fruit trees, gives it as a fact of observation that fruits in dry and severe climates are more apt to be of a deep and decided color. Along with this there is a strong tendency to pubescence and bloom. As one passes eastward from France there is a gradual increase in the above mentioned qualities. The same, he tells me, is true in going westward from New York upon our own continent. Dr. Sturtevant has been a student of variations in fruit, and he is recorded as having said:* "That any fruits are most highly flavored in their most northern localities and larger and finer looking toward the South."

Those pomologists who have compared the specimens of the same variety of fruit which have been brought together from widely separated areas at our national exhibits, I think will bear me out in the assertion that Western fruits are brighter colored than those produced along the Atlantic coast. This is particularly true of apples, and the general prizes secured by Western States for general exhibits may be sufficient testimony to the fact How much of this difference is to be ascribed to soil and treatment, and how much to atmosphere, heat, moisture, etc., it is not easy to state.

It is hoped that what has been said will lead to a discussion of the subject and secure a long list of interesting and important facts as a basis for future comparison.

In continuance of the same subject, Jos. H. Bourn, of Providence, R. I., presented the following notes:

In every clime, fruits manifest a tendency to display color. Every climate is adapted to grow certain classes and varieties of classes of the fruits proper. Fruits of a warm climate mature the most rapidly and take on more of the yellow tints than of the brilliant hues, while at

* Botanical Gazette, Vol. X., page 367.

the north, a contrary effect, I think, is more frequently noticed, and the brighter shades predominate. Pears grown in California, we recognize as having a paler yellow than the same varieties on the Atlantic coast, influenced in a measure probably by refrigerating influences, while in the vicinity of Norfolk, Virginia, the Angouleme pear assumes the dark shades of red and brown to an intense degree.

Wherever a considerable change of climate exists, classes and varieties of fruits are cultivated that are suited to the conditions of the locality, and in some instances the same kinds adapt themselves to several positions, all of which have their characteristic colors, by which they are recognized at maturity. The skin of most fruits has shades of yellow and green ground, the former increasing in intensity, with the process of oxidization has caused fermentation, to such a degree as to produce a brown appearance, which is a state of insipid decay. All classes of of fruits have a peculiar style of coloring which belongs to their order, and many are pale in the shade, and more or less ruddy on the sunny side. Apples are light and dark red, crimson, greenish yellow and orange yellow, greenish white and yellowish white, russety brown and straw color; but are usually shaded, pencilled, striped and marbled with the different hues, sprinkled with white, bronze, russet and black dots, and often have a purple and white bloom. Pears have the different shades of yellow, green, olive, russet, orange, crimson, brown, red, lemon and gray; overspread with blushing tints, carmine dots and brownish red in the sun. Cherries are purple, black, red, yellow and amber in color; plums green, lilac, red, yellow, purple and brown covered with a blue, white and lilac bloom; strawberries are crimson, maroon, scarlet, red and white; olives dark green; pomegranites yellowish orange with a rich red cheek; mulberries are red, black and white; raspberries orange, crimson, yellow, red and cream; grapes black, red, amber, white, purple and golden, with a white, lilac and blue bloom; apricots yellow, red and orange, while the shades in the peach resemble those in the pear except that the green predominates over the yellow. Now, the nutritive elements of the several fruits grown at the North, are developed in the same scale of profusion as at the South, and their predominant form is as decidedly saccharine as in the tropics. All that belongs to the ripening stage is similar; the essential oils and the concentrated elements of seeds and fruits, whether nutritive or aromatic. The distinction observed is that a greater quantity of water is contained in Northern fruits, while those of the South have more of the nitrogenous element to serve as food, and are essentially refrigerant in their action. In the investigation of our subject, we are particularly desirous to know if there is a peculiar state of the atmosphere in regard to heat and moisture that prevails in any given place, that exerts an influence on fruit coloring, and whether the same sunbeam has a different effect as we proceed from the equator towards the poles. The fruits of the warm climates will not aggregate brighter tints than those of the cold; neither are the sun's rays more intense at the South than in our Northern regions and even in Canada during the Summer months. The difference is that our heat has a greater daily range, which renders us capable of greater elasticity in the adaptation of vegetable forms. Heat is only an agent that affects the colors in fruits, and we must understand some of the probable causes that produce these special hues, in order to ascertain how far they may be influenced by climatic conditions.

As fruits advance towards maturity, the green coating changes to the typical color of its kind, and takes on the yellow, blue, purple, red and orange shades, exhibiting varied hues, according to the state of oxygenation which the juices have

reached. It has been intimated that these tints may be contained in the tissues, ready to be momentarily brought out, as soon as the juices become slightly modified in chemical constitution, resembling autumnal foliage, and changed into coloring matter by the oxidation of the green granules, which change is simultaneous with the failure of the tissues to elaborate chlorophyll where the base of vegetable color is oxidized. During the physiological processes of the growth and development of fruit, heat often causes change of color, without any chemical variation taking place. Nature paints with light also to make fruits attractive; hence the most frequent variations are found where the power of heat and light has been most exercised. Influence of locality, arising from the presence of peculiar elements in the soil, the water and atmosphere; the nature of plant food; the photographic action of light, as well as some agency dependent upon chemical peculiarities in the earth, are causes which influence color changes. This coloring matter then seems to be, in no small degree, due to absorption, although the hues produced by the dispersion, interference and polarization of light, aid to frame a true theory of color. The process by which the painting of fruits with color is produced has not, we are aware, yet been solved, but it is not unreasonable to believe that the same causes may have produced the brilliant hues in both fruits and flowers.

Climate, then, is but a single agent, in connection with the complex laws which influence fruit coloring. The scarcity of the brilliant fruits in some seasons, doubtless, suggested the discussion of the present subject, and this phenomenon is noticed in the same orchards and upon the same trees, the most vigorous and healthy of which, after they have become established, usually show the brightest colors. The intense light of cloudless skies, absence of rain and dew, have their influence. The soil on which our fruit trees are planted has effect on the temperature of the air, as produced by the sun's heat, although a portion is lost in evaporation on all trees. Heat on sandy surfaces where orchards are planted, remains longer in immediate contact with the atmosphere surrounding the trees, than on loam and clay soils; the upper stratum of the latter, not being heated during the day, nor cooled during the night, in so high a degree as the former. The climatic conditions which prevail the present year, have not been favorable for the production of high colors in fruits. Perfectly dry air is nearly incapable of absorbing radiant heat; but when charged with aqueous vapor is a good absorber, and makes the combination of air, atmospheric vapor and water powerful agents in receiving and diffusing heat. If the sun's rays are a powerful element in causing fruit coloration, the present season ought to have brought out stronger hues; but has not the air loaded with vapor, abstracted solar radiation; or rather has not the sun's heat been absorbed to such a degree in its passage through the atmosphere as to influence the production of bright tints? I believe the slower growth of Northern trees, and the slower maturity of their fruits, do have an effect on their coloring. Late apples and pears hang in the crisp autumnal air and bright sunlight, after they have perfected their growth, as if to obtain a richer gloss of September and October coloring. Frequently we observe that fruits which have laid aside their natural functions assume the brightest lines, and specimens that ripen prematurely from unsoundness are generally the most showy. Fruits also sport in color, due not to accident, but to a regular law of progressive modification. Briefly the development of colors then at maturity seems to be related to extra oxidation, modified by light and other varying conditions which we do not yet understand. There no doubt exist unknown

laws which can explain to us the process by which the painting of nature with color is produced, which physical science has not yet solved. We do know that an innate tendency to variation and change in colors does exist everywhere in nature, and makes useful those tinted coatings to attract afar off the eyes of wandering birds and mammals, as well as for human contemplation and enjoyment.

Climate, without the influence of other agencies, does not bring out brilliant coloration in fruits any more than it effects their shape and flavor. The character of the climate mainly determines what kind of fruits will abound, for it is climate alone that causes oranges and bananas to flourish in the South—currants and gooseberries in the North.

In the display then of the brilliant colors in fruits, nature has poured forth a lavish store of beauty for the pleasure of man, although the utilitarian connection of fruits generally has made us cultivate them more for their pulp and sweetness than for their good looks. Showy fruits are universally more attractive, therefore have a higher commercial value; and it is this consideration of our subject that no doubt has prompted the present discussion. All of us would be pleased to know of a climate where the Lucrative, Rostiezer and Superfin pears can be made as attractive as the Montgeran, Abbott and Clairgeau, or the Rhode Island greening and Hunt russet apples as showy and tempting as the Astrachan or Tompkins King.

The following paper was next presented:

Behavior of Fruits at Different Altitudes.

BY A. E. GIPSON, GREELEY, COLORADO.

The fruit bearing area of our country covers a range of altitude from the level of the sea, and even below, to more than ten thousand feet above. In Colorado there is a difference of nearly five thousand feet between the altitudes of the fruit producing sections. This marked variation gives scope for a wide diversity of experiment, as well as of soil and climate.

The very brief treatment of the subject assigned me will be confined chiefly to noting some of the "behaviors" in my own State, and I shall assume that trees, as well as fruits, are included in, or contemplated by the topic. It should be remembered that here in Colorado, we are on the Continental Divide, and have the two great slopes of the Atlantic and Pacific. It the northeastern portion of the State, away from the immediate vicinity of the mountains, changes in temperature are often sudden and extreme and hence climatic conditions exacting. The hot, dry air of the plains, alternating with the winds from the region of eternal snows, and with the liability to late frosts in spring, combine to render fruit growing uncertain and often unsatisfactory. This is true, notwithstanding a magnificent climate during most of the year. Hence the "iron clads" are sought and regarded as an essential to successful fruit culture.

In the southern, and particularly the western portions of the State, fruits bordering on the semi-tropical, can be grown. Peaches, pears, nectarines, olives, apricots, California and foreign grapes, in the main, promise exceedingly well, and all this at an altitude nearly one thousand feet greater than that of the City of Greeley, the place of my residence. This fact, then, shows the difference in mean temperature between two great slopes of the continent.

The native fruits are found at different altitudes. The red raspberry, black and yellow currant, strawberry, gooseberry and bearberry, flourish at from six to nine thousand feet and upward. From five to seven and eight thousand feet are the homes of the wild dwarf cherry, service berry, red and yellow buffalo berry, plum, choke cherry, thorn apple, etc. A comparitively few only of these native

fruits do well when transplanted to the valleys and lower elevations. This is notably true of the raspberry, gooseberry and strawberry, which fail to respond to the most generous treatment under cultivation. The plum and dwarf cherry are improved in size and yield by domestication. These fruits are from three to eight weeks later in ripening in the mountains (depending on altitude and local surroundings) than are the same varieties on the plains and low lands, and while smaller in size are generally conceded to be finer and richer in flavor. It is the old story of the matchless flavor of the wild strawberry, enlarged. In general it may be said that, as altitude increases, the tendency is towards a decrease in size, both of tree and fruit, due largely to a shortening up of the growing season, and yet the higher up the more tenacious of life apparently. In the Rocky Mountains, on the very borders of timber line and almost in the midst of perpetual snow, may be found the strawberry and red raspberry, and it is a common experience to see delicate and beautiful flowers in full bloom on the very summit of the snow capped mountain.

A difference of a hundred feet in altitude will often effect tree, plant and fruit noticably. In fact, it may mean the difference between success and failure in certain localities.

It is probably safe to say the best fruits are grown on high land, in cool, airy exposures. The claim is likewise made that these situations are generally freer from those diseases and injurious attacks, to which the orchard is liable.

My own locality this season affords a striking illustration of the influence of altitude. In the immediate vicinity of Greeley, which is low down in the Cache La Poudre valley, and surrounded on three sides by bluff lands as well as sheltered by a thrifty growth of forest trees, blight has appeared with disastrous effect on several varieties of apple (more particularly crabs) and pear trees, while the higher and more exposed sections are thus far exempt. It may be stated, in this connection, that last Winter and in the early Spring, our section was visited by severe and prolonged dry, hot winds, with quite a marked variation of temperature at times between day and night. To this may be due the rather sudden appearance of blight, although our peculiar location may have considerable to do with the trouble, as is suggested by Professor Budd.

Fruit growers in all sections have observed the liability of low lands and depressions, to severe injury from frosts, where the uplands or more elevated tracts received little or no harm, and this also suggests the danger of obstructing a free circulation of air from the orchard.

A few things have been observed which may or may not be entirely peculiar to the State. First, the high color, clear and smooth appearance, together with the good keeping qualities of our apples, and often the early fruiting of the trees. Probably due largely to the dryness of the air and almost perpetual sunshine of this altitude. Secondly, the freedom of our plum trees from disease, and the fact, that while the curculio sometimes attacks the fruit, little harm seems to be done, aside from slight punctures of the skin. Thirdly, exemption from mildew, grape rot and kindred troubles. Likewise the fact that where the first settings of grapes (the fruit clusters) have been destroyed by late frost, a copious irrigation for two or three days thereafter has caused the fruit to reset abundantly. This has also been accomplished to a greater or less extent with strawberries and raspberries.

As illustrating the difference in climate condition between the Atlantic and Pacific slopes at the same altitude, it may be said that in Eastern Colorado many things require Winter protection that do not over the range on the Western side. The season of the ripening of the various fruits is another thing that has puzzled considerably the fruit growers of Colorado. The

classifications of other States in the same latitude have differed widely from our own experience. Many of their Winter apples ripen in Fall here, and yet some of our Autumn fruits are Summer farther East and so on. Again, in localities separated only by a few miles, a variation of from one to three weeks is seen in the time of ripening of the same varieties. This would seem to indicate that local conditions have more to do with this matter than latitude. It is likely also that the same is true of other things referred to in this paper which have been suggested as due to difference in altitude. In fact there is a reasonable ground for belief that much of the success and many of the reverses in fruit culture are due to a knowledge or lack of knowledge of local requirements and surroundings. Fruits would often behave much better if they were given a fair show.

The next topic was opened by the following paper:

Identification of Varieties of Hardy Orchard Fruits.

BY H. E. VAN DEMAN, WASHINGTON, D. C.

All classification of natural objects may be said to be only approximately correct, and strictly arbitrary. The problems presented to the biologist who essays to properly classify the varied forms of nature as he finds them, are with additional complications forced upon the pomologist. The established rules for such classification are frequently found to be unsuitable. To endeavor to keep pace with this multitude of variations, and to be able to locate their proper places, is a considerable part of the work of the scientist.

It was the ability to do this, acquired by continued application to the study of nature, that enabled Agassiz to tell upon sight of a fish scale, the species from which it came. The further we proceed with this classification, the more complex and difficult it becomes. It is easier to distinguish and separate the natural orders of plants, than the genera and species; and when the subdivisions of species are reached, even the most learned doctors disagree. At this critical place, and upon this treacherous ground, the pomologist is obliged to make his way. Where the botanist leaves the tangled threads of science and nature, the pomologist only begins to disentangle them. If the botanical doctors shake their heads in disagreement and confusion, why wonder that the pomologists do likewise.

To be able to recognize every variety of our commonest fruits, is utterly impossible even by the most experienced, as we all know full well. However, by carefully studying certain characteristics, and having a vast deal of experience with specimens grown under different conditions of culture, soil and climate, one may become able to generally determine the names of varieties.

To give in a simple way my views of what may be the cardinal points in such classification, is the substance of the hope that inspired this attempt in your presence to-day. I do so because I believe the subject is one which in the face of a deal of ignorance, ought to engage our frequent and thoughtful attention.

All will agree that certain characteristics of fruits are more constant than others. If we will consider which these are, we will have gained one point. To my mind, considering all classes of fruits, there is no one character so fixed as the form. Whether it be an apple, peach, pear, an individual grape, or a cluster of grapes, a strawberry, or a blackberry, this will in the main prove true. And it is true of the immature, as well as the fully developed specimens. Let us take the apple or pear, before they are fully out of bloom, and a difference in varieties may be noticed, by their elongated, rounded, or irregular forms.

To some persons all babies are alike,

but not so to the nurse or mother. Nor are all baby fruits alike to the observant pomologist, who like a good foster-father, watches them from infancy to ripe old age. A Chenango the size of a marble is not the shape of a Rambo, nor would a Vicar half so large be taken for a Sheldon. Indeed it would not be hard to tell the difference between such marked varieties even before their petals had expanded. A cluster of the compactly formed Elvira grape could be told from one of Creveling or even Concord when only large enough to be observed at all.

As these tenderlings grow, their peculiar forms enlarge rather than change. Even starvation, such as might prevent their reaching more than half size, would not materially alter their shape. Let this then be our main guide in identifying varieties, which together with others will be dealt with more fully in its proper place. Of course there are frequent variations from the typical form of a variety, which in some cases amounts to a radical change. These may occur from unaccountable sports of nature, or by accident, such as stings of insects or fungus diseases.

Another step will be, to define the several characteristics, and place them in their relative positions. To do this, we will be obliged to take up the several species of fruits in detail; and owing to the largeness of the field, I shall not attempt to go further than the hardy orchard fruits, as the title of my paper indicates. This will comprise what are usually known as the pomes and drupes. First among these is

THE APPLE.

Observed from a point perpendicular to its axis, an apple in form may be round, flat, conical, oblong or cylindrical; or from either end it may appear round, elliptical, angular, ribbed or scolloped. For more simplicity of description these latter forms may be called regular when round or nearly so, and irregular when otherwise. Then there are other peculiar forms, such as inclined, as in case of the York Imperial, or unequal, like Cooper and Colvert. In fact, very many apples have one side larger than the other. Twenty Ounce is almost equally remarkable for its regular contour, as if each specimen had been turned in a lathe.

The Basin is the depression which is almost always found at the apex or blossom end of an apple, and in which the eye is set. It is either wide, narrow, shallow or deep; regular, like that of Fall Pippin, waved as we see in Northern Spy, or folded into wrinkles like yellow Bellflower. In a very few apples, and some of the crabs, it is wanting.

The Cavity is at the opposite or stem end, and is sometimes very deep and narrow, or wide and sloping like Rome Beauty. Pryor's Red and Pewaukee have the cavity almost filled. In the case of Swaar, Roman Stem and a few others, it is marked by a peculiar welt, in which case it is described as being lipped.

The core is equally well marked, and usually conforms in a great measure to the exterior shape of the apple. One which is flat will have a wide or flattened core, and an elongated specimen a pointed or pyriform outline. Some varieties have very small, compact, or closed cores, while others, like Ortley, are so large and open that the seeds may be heard to rattle when the apple is shaken. If the outline of the core meets at the point of the calyx-tube, it is said to be meeting, or if some distance below, it is clasping. In examining specimens, I have found this to be quite uniform in those of one variety.

The Flesh is perhaps the next character least subject to change. It is made up like all organic substances of single cells, which are large or small, compactly or loosely placed, and filled with sugar, starch, acids and water, according to their true individualities. Who of us do not know the difference in weight between

Yellow Newtown and Ben Davis, or the color of the flesh of Fameuse from that of Winesap? Or whose taste is so poor that he cannot tell in the dark whether he is eating a rich and spicy Grimes Golden, a melting Primate, or a coarse and acid Oldenburg? Indeed, the whole generation of Russian apples, so far as tested in this country, can be generally distinguished by their coarse texture and lack of spicy aroma. The flesh of an apple may be said to be coarse, fine, tender or firm; white or yellow, dry or juicy; and in flavor, sweet, sub-acid or sour, rich or insipid. Of course the climate where grown and the state of maturity have very much to do with the flavor, but less as regards color and grain of the flesh.

The eye which is composed of the calyx and the small cavity which is hid by it, is another reliable mark. If the sepals are long and reflexed as in the fall orange and the crabs, or very short like those of Shannon, there is no trouble to note their difference; but this does not often appear so plainly. There is a difference in the width and length of the calyx-tube also. If the sepals are so constructed and related as to form a closed or an open eye in one specimen of a variety, it is a good indication that all others of the same variety are similarly formed.

Those peculiar little marks on the surface of the skin which we call dots, are very likely to be uniform in color, size and shape, on one variety; except their being smaller and closer to each other towards the eye. They are numerous, or scattering, large or minute, dark or light, round, elongated or star-shaped, and surrounded with light or green bases. Some are so prominent as to be easily felt, and others entirely the reverse. Although small, these dots are in no wise to be overlooked.

The seeds may be numerous or rare, large or small, yellowish like Hightop, or gray, brown, or black. In shape they vary also from short and plump, to slender and imperfect as may be found in King of Tompkins.

The surface is sometimes uneven, lumpy, or pimpled, a good example of which is seen in Twenty Ounce. Again it is smooth and glossy like Wealthy or waxy to the touch. Lowell is often called "Greasy Pippin" from this cause. All grades may be found, from a surface like polished glass, to the rough and rasping coat of the russets. Its color, is often depended on far too much. Of course it is a striking feature, but it is so often and so easily changed by climate, culture, season or having been grown in open sunshine, or in the shade, that we are apt to be misled by it.

If reddish stripes are never displayed, but a mere blush as on the Belmont and Maiden's Blush, or if no red color appears at all, it is proper to call the variety self-colored. Detroit Black, Lawver, and Carolina June, although very highly colored, will be found upon close inspection to have no stripes; and are hence properly classed with those that have no red color at all. The variation is in the degree of the blush. Those that are striped or splashed with red in its different tints and shades, form another distinct class, and also the largest. Saint Lawrence is one of the most distinctly marked, and Gloria Mundi one of the least so.

That peculiar and roughened character of the skin, which we call russet, forms the third class as regards color, and is the most puzzling of any. Roxbury is usually distinct enough, but even its coating varies with the conditions of growth and climate. I have seen American Golden Russet almost as fair and blushing as Tewksbury, and Pryor sometimes heavily russeted, and again as brightly striped as Ben Davis. There are more or less russet marks on nearly all varieties, and especially about the cavity, which is indeed a very good guide to their identity. In some, like Melon, and Hubbardston, it gives a sort of bronzed ap-

pearance to the entire surface. Another form of it, is a sort of leather-cracked appearance about the basin, which is peculiar to very few kinds. I have never seen a specimen of Westfield that did not have it, although in some cases but very slightly.

One of the most peculiar marks is what might be called pin-scratches, running from stem to eye, notably on Tallman and rarely on Keswick. They never exceed five, and in the Northern climates are much more distinct than in the South and West. There are two other external characteristics that ought not to be overlooked. One is a delicate and easily removed substance which we call bloom. The Russian varieties and the crabs are almost invariably covered with it. Aside from the beauty it adds to the fruit it is a reliable mark of identity. The other is a grayish-white coating, such as is seen in stripes upon White Pippin and White Winter Pearmain. Sometimes it is suffused and mixed with other colors in such a way as to give a dull color to otherwise bright skin.

The size of all fruits is so varied by climate, culture and the many accidents and exigencies of growth, that we must not lay too much stress upon this point. We see Lady apples as big as average Maiden's Blush, and Fallawater the same size; and in such cases we are forced to depend on shape, or almost any other indication. Apples may very properly be graded as very small, small, medium, large and very large.

The stem is with some kinds a constant mark, but it often fails to be so. However by examining a number of specimens a very good idea can be had of its typical length and thickness It may be short, medium or long, and stout, or slender. Occasionally there is a pulpy growth upon the stem, which may be denoted as fleshy. While Winter Pearmain has this so peculiarly enlarged at the extremity, and so never-failing, as to be a sure indication of this variety—at least I have never seen a specimen without it. The points of resemblance between the pomes are so close that but little deviation is necessary, and a repetition of descriptions will be avoided whenever possible.

THE PEAR,

In form may be described as for the apple, except that many kinds may be denoted as pyriform, instead of "conical," and turbinate, or top-shaped, is very common. Some, like Keiffer, which taper towards both ends, may be called biconical. The definitions of the stem end, or apex, as it should be called in most pears, may be simply pointed like Tyson, depressed as the Angouleme, or with the stem deeply sunken when it resembles the "cavity" of the apple. Most of the Asiatic pears are thus formed.

The core differs from that of the apple in being sometimes hard and gritty, and often inclined to rot, before any sign of decay is seen on the surface.

In point of color, there is an almost entire absence of striping with high colors; although some kinds especially when grown well to the north are quite plainly striped with red.

The stem of the pear, has a much more decided tendency to be set at an angle to the axis of the fruit, and should in such cases be termed inclined. The flesh is apt to be buttery, melting and often granular.

THE QUINCE

Has comparatively few varieties, and these vary but slightly in form. Some have a plainly defined neck to which the stem is attached, if we may call the portion of the woody branch that holds the fruit, a stem. Some are more angular than others, but all are slightly so. In size, they vary quite decidedly, Rea being perhaps the largest. The flesh of Portugal is not so tough as that of other varieties and is a lighter yellow, but turns beautifully purple when cooked.

The skin of all kinds is coated with a

peculiar pubescence which is easily rubbed off, displaying a smooth surface of an almost uniform golden color, void of distinctive marks of any kind. The season of ripening gives little clew to the name, except that the Pear shaped and Portugal, are later by some two weeks than most of the others.

THE PEACH.

Is a fruit that has its strains or races, which are, perhaps, as plainly separated as are the crabs from the apples. We all know the distinctive type of peaches called Indian, with its peculiarly brownish and striped fruit, and dark-colored twigs. The Spanish and Chinese strains, now coming into successful culture in the South, where our common varieties of the Persian stock fail, have their own peculiarities of tree and fruit. But all kinds are easily divided into clings, semi-clings and freestones.

In form, they are either round, oblong, pointed like Heath Cling or unequal like Honey, which is decidedly larger on one side. A crease or suture running parallel to the edge of the stone is found in greater or less degree in all specimens, and is worthy so far as it differs in varieties.

In color, the peach is much more constant than the apple. It is greenish, cream-colored, white, yellow, red, or blushed, mottled, specked and striped with carmine, in all possible tints and shades. The color of the flesh corresponds quite well with the ground color of the skin which is really only that of the flesh shown through the translucent covering. In texture, however, it is either firm, and inclined to be tough as are most of the clings, or melting like Louise. Some kinds are very dry and mealy, and others dripping with juiciness.

Another reliable mark is the color of the flesh at the stone. The variety called Snow has no tint of red even there, nor has any of its seedlings that I have seen. But a great many kinds are red or pink, when the flesh is either white or yellow. There is a whitish substance attached to the flesh next the stone, which is very bitter and greatly lessens the value of such kinds as have it.

The stone itself, is characteristic in shape and size. That of Amsden is plump and short and Peen To about the shape and size of a very round hazelnut. The Crawfords are long and pointed and very coarsely corrugated, and apt to be split. The seed of Morris White appears as if it had been mashed at the base between the thumb and finger while soft. All of the Indian class have the point turned to one side or hooked. The stones bear good marks from which to determine varieties.

The downy covering of the skin differs in length and quantity and when entirely wanting the varieties are called nectarines. In my own experience I have grown nectarines from peach seeds.

THE PLUM

Is represented in the orchards of America, by at least five distinct botanical species, and perhaps more. The form in all of their varieties, as with other fruits, is the best key to their identity. Nearly all have a suture, and in some cases it is very marked.

All are characterized by a smooth surface, covered with a bloom which varies in thickness, except Prunus Simoni of probable Asiatic origin, and P. glandulosa, which two species are somewhat pubescent like the apricot. It is only very recently that the latter has been brought into cultivation in a small way, but with good hopes of success.

The flesh of all kinds is yellow or green of different shades except a few Japanese varieties that are red to the stone.

The character of being cling or freestone is equally as dependable as in case of the peach. The length of the stem is with the plum more constant than with the other fruits. Some, like Washington, have very long, and others very short

stems, of which Green Gage is a good example. The character of its attachment to the fruit is variable, being sometimes set in a rather deep cavity, and sometimes none, but, instead, on an elevation or neck.

The color of the skin is from pale whitish-yellow, to yellow, green, pink, red, purple, blue and black. The larger and by far the better class of plums belongs to Prunus domestica or the common European species. Our native species have all of the red and yellow colors, but none of the green, blue or black, so far as I have seen. They are also different from the former, by the character of becoming exceedingly tart when cooked, no matter how sweet to the taste before, and if any are doubtful of this, let them make the experiment.

The varieties of P. Chicasa, seem to have a habit of being earlier in their season of ripening, than P. Americana. Wild Goose is a good example of the former, and Miner of the latter. Kelsey's Japan is so remarkable in size and shape of the fruit, and its leaves and branches so different from other cultivated kinds, and being as tender as the fig, it is quite clear that it belongs to a distinct species, but just what that species may be, is a query. The varieties of

THE CHERRY,

Of interest to the pomologist, have been variously classified by authors. Downing divides them into two classes, the first including the Hearts and Bigarreaus, and the second, the Dukes and Morellos. The former is characterized by a heart shape, a mild or sweet flavor, and rather firm flesh. The color of the Bigarreaus is usually quite fair. The latter class has an oblate form, is never pointed, and the flavor is from a pleasant tart, to a sharp sour.

The cherry usually has a suture, similar to the other drupes, but sometimes a welt in place of it. The Morello type is usually regular, and without either of these marks in a special degree.

The color of the skin is from white to black, or nearly so. Nothing short of extended experience will enable one to determine the soft creamy tint of the depth of red and purple, which belongs to a variety. Even then no one can distinguish all. The less the number of colors nature has employed in painting a species of fruit, the less the points of difference one has to aid him in identifying its varieties. This is especially true of the cherry. The flesh in point of color is very nearly like that of the skin. The shape of the seed corresponds with the shape of the fruit in a great measure. The Morellos have it round and the others oval or pointed. The length of the stem does not vary greatly but is most uniform on the sweet varieties. The depression at the base of the stem is not plainly contrasted.

THE APRICOT

Is a fruit of which we have very little chance to observe this side the Rocky Mountains. On the other side where the curculio is practically unknown, it is extensively grown, and the varieties are numerous enough to give considerable trouble in identifying them. They reproduce from seed with comparatively little variation. Their general contour is round, with an occasional elongated or compressed form. A well marked suture is peculiar in some kinds, and others have none. The pubescence is universal, and never thick.

The shape of the stone is a very good point of recognition, as some are nearly round, and others broad and flat. The taste of the kernel is a reliable index, as some are bitter, and some as sweet as an almond.

The color, is yellow, orange, or a rich cream, with an over-color of red which sometimes darkens into brown. Many varieties are delicately marked with crimson and purple dots, and small specks.

The flesh is usually melting, and colored a little deeper orange or yellow than the skin. It is almost free from any inclination to cling, and not red at the stone like the peach.

In all fruits, the season of ripening in a given locality is a guide, but unless we know where a specimen is grown, its state of maturity is of little value. I have at this time (Sept. 10), Carolina June apples fresh from the tree in Northern Michigan and in prime order.

The bearing quality of the tree, is through a series of years, a help in making out its variety, and so is the style of the tree and twigs, and the color of the bark. What is known as the quality of a fruit is gauged largely by the taste of the eater; but it ought, however, to give some idea of the variety. The peculiar flavor of a Westfield, or an Esopus, is apt to be remembered.

With these random thoughts, although poorly expressed, I submit the subject to your consideration, trusting my imperfect treatment of it, may be in some measure excused. Prune it as you like—transplant it to better soil—but let us, I beg you, give this crooked and stunted tree, better culture.

The Secretary in continuation of the subject read the following notes from Dr. W. J. Beal, of Michigan:

New varieties of our leading fruits are multiplying with increased rapidity. As usual in former years, they have been described—or partially described, by the character of the fruit, the stem and the leaves.

In a good many instances, this description is so incomplete that no one can be certain of the variety by a description alone.

Since my contributions to this Society concerning the value of the flowers as an aid in determining varieties of apples and pears, one of my students, W. L. Snyder has reviewed the subject confirming all that those papers affirmed. He has also studied the varieties of many of our leading sorts of strawberries and finds there; also, that the inflorescence and the flowers contain some of the best and most reliable characters for describing varieties.

My colleague, Prof. L. H. Bailey, Jr., has also given attention to this subject, and believes, as I do, that no fruit can be said to be fully and well described without making use of the flowers. A. A. Crozier, of the Botanical Division of the United States Agricultural Department, a former student of mine, has also been studying this subject, and confirms all that has been written. He has been the means of starting a collection of the flowers of apples for the herbarium of the Agricultural Department at Washington.

No matter what and how fruit growers describe new sorts in the future, let them not lose sight of the fact, that many of the best peculiarities are to be found in the inflorescence and the flowers and the young fruit.

DISCUSSION.

CHAS. A. GREEN, New York: This is a very valuable discussion; I remember once of writing to Mr. Downing for the name of an apple, of which I gave a long account. I received the reply that if I would describe the apple he would be pleased to attempt to name it for me. I tried again and found many points which I had at first overlooked. But again I received the same reply. I think we have much yet to learn concerning the art of describing fruit.

Then followed a paper on:

The Nomenclature of our Russian Fruits.

BY CHARLES GIBB, ABBOTSFORD, QUEBEC.

By resolution of your Society at Grand Rapids, in 1885, I was "given the special work of revising and arranging the nomenclature of American importations of Russian fruits," but it seemed best not to undertake the work at once. There were too many queries; too many things supposed, but not known. My suggestions are now the better for the delay. Since then I have seen Dr. Edward Regel at St. Petesburg, also his son, Mr. Albert Regel, who had lately returned from Turkestan, and who was his father's correspondent when making that general collection of the apples of Russia, from which he selected those sent to the United States Department of Agriculture in 1870. The result is that I can now offer you a correct Russian original of that importation, except two or three names, which can only be vaguely guessed at.

It may be remembered that the list sent by Dr. Regel to Mr. Wm. Saunders, of the Agricultural Department at Washington, was lost at the Russian embassy there, and Mr. Saunders was thus forced to issue it in the form in which it was returned to him.

I also had, last winter, several interviews with Count Alexeeff, of Moscow, a Russian physician and scientist, who has aided me very much in this work.

Owing to the confusion existing among the names of these Russian fruits, Prof. Budd and I talked matters over, and I prepared lists of these different importations, and they appeared in a bulletin of the Iowa Agricultural College in 1885, although a large number of St. Petersburg varieties interwoven at the last moment, by Prof. Budd, I must not be held accountable for.

I have aimed at:

1. A euphonic rendering of the Russian name, leaving no doubt as to the Russian letters composing that name.

2. For use in this country, a Russian name, or a translation, as short and fit as I can suggest, retaining that given in the Department list whenever practicable. I have, however, retained several short Russian names, viz.: Anis instead of Anisette, Arcad instead of Arcadian, Borovinka instead of Mushroom, Repka instead of Turnip; also Reinette rather than Queen. I have also retained the word Naliv, which is applied to the Skvosnoi, Glasapfel or Klarapfel, or Pomme Transparente, and technically does not mean "juicy." Unmusical names like "Cut Apple" and "Smelling Apple" I have thought best to change.

Names in the Russian column in brackets, are names which do not appear in Regel's Russkaya Pomologaya published in 1868.

RUSSIAN

IMPORTED FROM ST. PETERSBURG IN 1870, BY

NO.	SUGGESTED AMERICAN NAME.	SUGGESTED RUSSIAN NAME.
1.	Red Astrachan.	Astrachaner rother.
2.	White Summer Calville.	Calville weisser sommer.
15.	Avenarius.	Sussapfel von Avenarius.
44.	White Astrachan.	Astrachaner weisser.
54.	Luiken.	Luikenapfel.
60	Red Pine.	Ananasapfel rother.
61.	Noble Redstreak.	Edler rosenstreifling.
68.	Early Champagne.	Champagner fruher.
69	Summer Pear.	(Sommer birnapfel.)
70	Winter Pear.	(Winter birnapfel.)
105.	Russian Gravenstein.	Grafensteiner Russischer.
122.	Revel Borsdorf.	Borsdorfer Revaler.
128.	Sheepnose.	Schafnase.
153.	Transparent Naliv.	Skvosnoi naliv.
157.	White Naliv.	Bielui naliv.
159	Lemon.	Limonnoe.
161.	Longfield.	Langerfeldskoe.
162.	Buschbohn.	Buschbohn.
164.	Heidorn.	Polosatoe Heidorna.
166.	Summer Aport.	Aport lietnee.
167.	Yellow Sweet.	Jeltoe sladkoe.
169.	Green Sweet.	Zelenka sladkaya.
170.	Revel.	Revelskoe.
171.	Winter Glass.	Stekliannoe simovoe.
173.	Earliest.	Skorospielka rannaya.
174.	Little Pipka.	Pipka (———).
176.	Red Sided.	Krasnobokoe.
177.	Green Streaked.	Zelenka polosataya.
178.	Barloff.	Barlovskoe.
180.	Neelovskoe?	Neelovskoe?
181.	Champagne Pipka.	Pipka champanskaya.
182.	Red Summer Calville.	Kalvil krasnui lietnui.
183.	Burlovka.	Burlovka.
184.	Arabka.	Arabkoe.
185.	Anisovka.	Anisovka.
186.	Revel Glass.	Steklianka Revelskaya.
187.	Green Glass.	Steklianka zelenka.
188.	Yellow Arcad.	Arkad jeltui.
190.	Tiesenhausen.	Tiesenhausenskoe.

APPLE TREES.

United States Department of Agriculture.

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Red Astrachan.	Astrachaner, Rother.
White Summer Calville.	Weisser Calville, Sommer.
Von Toenarius Sweet apple.	Sussapfel von Toenarius.
White Astrachan.	Astrachaner, Weisser.
Luiken apple.	Luikenapfel.
Red Duck apple.	Anasapfel, Rother.
Noble Redstreak.	Edler Rosenstreifling.
Early Champagne.	Champagner, Fruher.
Summer Pear apple.	Sommer Birnapfel.
Winter Pear apple.	Winter Birnapfel.
Russian Gravenstein.	Grafensteiner, Russicher.
Borsdorf Revel apple.	Borsdorfer Revaler.
Sheepnose apple.	Schafnase.
Transparent Juicy apple.	Skvoasnoi Nalin.
Juicy White.	Belui Nalin.
Lemon apple.	Limonoe.
Longfield's apple.	Langerfelskoe.
Buschbon.	Buschbon.
Heidorn's Streaked.	Polosatoe Heidorns.
Summer O'Porto apple.	Aport Letny.
Yellow Sweet.	Scholtoe Sladkoe.
Green Sweeting.	Sclenka Sladkaya.
The Revel apple.	Revelskoe.
Glass Winter apple.	Stekliannoe Z Simowoe.
Earliest Early.	Skerospelka Rannaja.
Little Pipka.	Pipka, Malaja.
Red-sided apple.	Krasnabakoe.
Green Streaked.	Schlenka, Polosstaja.
Barloff's apple.	Barlowskoe.
Negoloff's apple.	Nejolowskoe.
Champagne Pipka.	Pipka Champanskaja.
Calville Summer-red.	Kalville Kwasnuiletny
Burloffka apple.	Burlowka.
Arabian apple.	Arabskoe.
Anisette.	Anisowka.
Glass Revel apple	Steklianka Revels Kaja.
Glass Green apple.	Steklianka Selonka.
Yellow Arcadian apple.	Arkad Scholti.
Tiesenhausen.	Tiesenhausenskoe.

NO.	SUGGESTED AMERICAN NAME.	SUGGESTED RUSSIAN NAME.
196.	Sweet Streaked.	Polosatoe sladkoe.
197.	Crooked Spike.	Krivospitsoe.
198.	Polumiron.	Polumiron.
199.	Waxen naliv.	Naliv roskovoi.
200.	Rosy Repka.	Riepka vosavaya.
202.	Hare Pipka.	Saitchia pipka.
203.	Arcad.	Arkad.
204.	Rubets.	Rubets.
205.	Karabovka.	Karakovka.
206.	Czar's Thorn.	Tsarskui schip.
207.	Stupka.	Stupka.
208.	Royal.	Korolevskoe.
210.	Wine Rubets.	Rubets vinogradnui.
212.	Borkoff.	Borkovskoe.
213	Stepanoff.	Stepanovka.
214.	Garden.	Sadovskoe.
215.	Kustoe.	Kustoe.
217.	Sugar Sweet.	Sacharnoe.
218.	Vochin.	Vochinskoe.
219.	White Swan.	Bielaya lebedka.
220.	Silken.	Schelkovka.
225.	Getman's Bean.	Getmanskui bob.
226.	White Rubets.	Rubets bielui.
228.	Vochin's Crimean.	Krimskoe Vochina.
230.	Titovka.	Titovka.
231.	Golden Arcad.	Zolotoi arkad.
234.	Muscatel.	Muscatelnoe.
236.	Antonovka.	Antonovka.
240.	Lejanka.	Lejanka.
242.	Broadcheek.	Schirokolitchiko.
245.	Borovinka.	Borovinka.
246.	Prolific.	Plodovitka.
247.	Popoff.	Popovka polosataya.
248.	Biel.	Biel.
252.	Aport.	Aport.
260.	Winter Streaked.	Simnee polosatoe.
261.	Repka Aport.	Rieptchatni aport.
262.	Charlamoff.	Charlamovskoe.
264.	Scented.	Duchovoe.
265.	Gorke Pipka.	Pipka Gorkaya.
266.	Novgorod Streaked.	Polosatoe Novgorodskoe.
267.	Pear.	Gruschevka.
268.	Zakoritnoe.	Zakoritnoe.
269.	Rosy Aport.	Aport rosovui.
272.	Little Hat.	Schapotchka.
273.	Autumn Pear.	Gruschevka osennaya.
274.	Rosy.	Rosovoe.

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Streaked Sweet.	Polosatoe Sladskoe.
Curly Spiced apple.	Kriwospizoe.
Crossed Barbel.	Polu Miron.
Waxen Juicy.	Naleiv Woskowoi.
Rosy Little Turnip apple.	Repka Rosowaja.
Hare Pipka.	Saitschia Pipka.
Arcade.	Arkad.
Cut apple.	Rubez.
Karaboff apple.	Kajabowka.
Czar's Thorn.	Zarski Schip.
Stoupka.	Stupka.
Royal.	Korolewskoe.
Cut Wine apple.	Rubezuinogradni.
Berkoff's apple.	Berkowskoe.
Stepanoff's apple.	Stepanouko.
Garden apple.	Sadowskoe.
Bushy apple.	Kustoe.
Sugar Sweet.	Sacharnoe.
Fokin's apple.	Fokinskoe.
White Swan.	Belaja Tebedka.
Silken apple.	Schołkowka.
Getman's Bean.	Getmanski Bob.
White Cut.	Rubez Belui.
Vochin's Crimean apple.	Krimskoe Wochina.
Titus apple.	Titouka.
Yellow Arcadian.	Sołotoi Arkad.
Muscatel.	Muscatelnoe.
Anthony's apple.	Antonouka.
Lieby apple.	Teschanka.
Broadleaved.	Schriokolitschiko.
Mushroom.	Borouinka.
Prolific.	Płodowitka.
Popoff's Streaked.	Popouka Polosataja.
White.	Beel.
O'Porto apple.	Aport.
Winter Streaked.	Simnoe Polosatoe.
O'Porto Turnip Seedling.	Aport Reptschati.
Charlamoff.	Charlamowskoe.
Smelling apple.	Duchowoe.
Butter Pipka.	Pipka Govkaja.
Novgorod Streaked.	Polosatoe Nowgorodskoe.
Pear apple.	Gruscheffka.
Saccharine.	Sakaritnoe.
O'Porte Rosy.	Aport Rosowui.
Little Hat apple.	Schapotschka.
Autumn Pear apple.	Gruscheffka Bsennaja.
Rosy.	Rosowoe.

NO.	SUGGESTED AMERICAN NAME.	SUGGESTED RUSSIAN NAME.
275.	Zolotareff.	Zolotarevka.
276.	Half Glassy.	Polusteklianka.
277.	Vargul.	Vargul.
278.	Red Borovinka .	Borovinka krasnaya.
279.	Winter Aport.	Aportovoe simovoe.
282	Voronesh Reinette.	Renet Voroneshskui.
283	Slast	Slast.
284	Kremer's Glass	Steklianka Kremera.
285	Ribbed Naliv.	Rebristoe nalivnoe.
286.	Kremer.	Kremerskoe
287	Riga Transparent	(Rigaer skvosnoi naliv.)
288.	Raspberry.	Malinovskoe.
290.	Ukraine	Ukrainskoe
295	Imperial.	
304.	Switzer.	Suislepper.
310.		Christapfel
313	Muscatel	Muscatapfel (Livlander Rgl.)
315.	Herren.	Herrenapfel.
316	Red Reinette	Reinette rothe
317.	White Pigeon	Golubinoe (bieloe not Rgl.)
321	Sweet Pipka	Pipka sladkaya
322.	Cinnamon	Koritchnevoe
323	Riepovka	Riepovka
324.	German Calville	Niemetskui kalvil.
327	Yellow Arcad.	Joltui arkad.
330.	Streaked Naliv	Polosatoe nalivnoe
332.	Early Prolific.	Plodovitka rannaya
333	Red Transparent	(Skvosnoi krasnui.)
334	Yellow Transparent	(Skvosnoe jeltui.)
335.	Green Transparent	(Skvosnoi zelenui.)
336	White Transparent	(Skvosnoi bielui.)
337	Serinkia.	Sierianka
338.	Revel Pear	Gruschevka Revelskaya
339	White Reinette	(Renet bielui.)
340	Livland Raspberry	Himbeerapfel Livlander
341	Borsdorf	Borsdorfer.
342	Thaler	Charlottenthaler gelber.
343	Red Wine	Weinapfel rother (herbst, Rgl.)
344.	Sultan	Sultanapfel.
350	Lapouchoe	Lapouchoe.
351	Prolific Sweeting.	Plodovitka sladkaya
352.	Resonant	Svonkoe.
354.	Aromatic Spike	Krivospistoe aromatnoe
355	Autumn Aport	Osennui aport (Rgl.)
359.	Pickle	(Motchetchnoe.)
360.	Pound.	Funtovoe.

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Zolotoreff's apple.	Sototoreffka.
Half Glassy.	Polu Stekianka
Wargul.	Wargul
Red Mushroom	Borowinka Krasnaja
Winter O'Porte.	Aportowoge Simowoe
Woronech's (name of province)	Renetto Woroneschski
Apple Sweet.	Slast.
Kremer's Glassy	Steklianka Kremer's
Turnipy Juicy apple.	Repristoe Walisonoe
Kremer's, (seedling.)	Kremerskoe.
Riga Transparent Juicy	Rigaer Skwosnoinalin
Raspberry	Malinowskoe
Ukraine apple.	Ukrainskoe.
Imperial.	Imperial.
Switzer.	Suislepper.
Christmas apple.	Christapfle
Muscat or Persian apple	Muscatapfel.
Lord's apple.	Herrenapfel
Red Queen	Rothe Reinette
White Pigeon.	Golubinoe Beeloe
Sweet Pipka.	Pipka Sladkaja
Browny apple.	Kovitschneoe
Turnip apple.	Repouka.
German Calville.	Neemezki Kalville
Yellow Arcadian apple.	Scholti Arkad
Juicy Streaked.	Polosatoe Naliwnoe
Early Prolific.	Plodowitka Ramaja
Red Transparent.	Skwosnoi Krasnoi
Yellow Transparent.	Skwosnoi Schotoi
Green Transparent.	Skwosnoi Selennoe.
White Transparent.	Skwosnoi Beeloe
Grayest	Scrinka
Revel Pear apple	Gruscheffka Revelskaja.
White Queen.	Reinetti Beelui
Lowland Raspberry.	Himbeerapfel, Lievlander
Borsdorf	Borsdorfer
Charlottenthaler (name of a place) apple.	Scharlottenthaler Golba.
Red Wine apple	Weinapfel, Rother
Sultan apple.	Sultanapfel.
Burr apple.	Lapouch
Prolific Sweeting.	Plodowitka Cuadkaja
Resonant apple	Swonkoe
Curly Spiced Aromatic.	Kriwospizoe Aromatnoe
Autum Orange	Aport Herbst
Wetting apple, literally apple to be preserved in water (as done in Russia.)	Motschetschnoe
Pound apple.	Funtowoc.

NO	SUGGESTED AMERICAN NAME.	SUGGESTED RUSSIAN NAME.
362.	Lead	Svintsovka.
364.	White Vochin.	Biel Vochina
367	Red Streak.	Polosatoe.
368.	Sugar Miron.	Miron sacharnui
369	Pipka.	Pipka.
370	Swan	Lebedka
371	German Skrute.	Skrute Niemetskui.
372	Petrovskoe	Petrovskoe
374.	Pendant Ear.	Vislouchoe.
375.	Cinnamon Pine	Koritchnevoe ananasnoe.
377.	Yellow Lemon.	Limonnoe jeltoe
378	Hibernal	Osimni
380	Moscow Pear	Gruschevka Moskovskaya.
382.	Green Butskaya	Butskaya zelenka.
385.	Bode	(Bodevskoe)
387.	Good Peasant	Dobrui krestianin.
393.	Imperial Citron.	Tsitronnoe Tsarskoe.
398	Enormous.	Krupneena.
399.	Green Crimean.	Krimskaya zelenka.
402.	Borsdorf	Borsdorfer.
403	Sweet Anis	(Anis sacharnui.)
406	Sweet Pipka	Pipka sacharnaya.
407	Blackwood	Tchernoe derevo.
408.	General Greig.	General Greig.
409	Vochin.	Vochinskoe.
410.	Little Repka	Reipka malenkaya.
413	Cross.	Skrijapel.
424.	Bergamot	Bergamotnoe
425.	Painted Anis	Anis rospisnoi.
426.	Svinets.	Svinets.
427	Anissim	Anisimovskoe.
429.	Bosklonoff	(Bosklonovka)
430	Waxen Arcad.	Arkad kruglui voskovui
433.	Orloff	Orlovskoe
437.	Saxonian?	(Saksonskoe)
438.	Painted.	Rospisnoe.
439.	White Crimean	Krimskaya biel
441	Rattle	Gremuschka
442	Yellow Calville	Kalvil jeltui.
444	Lubsk Reinette.	Renet Liubskui.
445	Romianka.	Romianka
447	Keiv Reinette	Renet Kievskui.
448	Cardinal	Kardinal
450	Handsome White.	Biel krasavitsa
451		Vorschtapel
453	Beautiful Arcad.	Arkad krasivui
455	Berry	Riabinovka.

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Lead apple.	Swinzoffka.
White Wochins (a name) apple.	Beel Wochins
Red Streak	Polosatoe.
Sugar Barbel	Mirone Sacharni
Pipka.	Pipka
Swan apple.	Lebedka
Skrout, German.	Skrut, Deutscher
St. Peter's.	Petrowskoe.
Pendent Ear apple	Wislowchoe.
Browny Pine apple	Koritschewoe Ananasnoe
Yellow Lemon	Limonnoe Scholtoe
Hibernal apple	Orsimni.
Moscow Pear apple.	Grnscheffka Moskoloskaja
Russian Green apple.	Buzkafa Selonka.
Bode's apple.	Bodewskoe.
Good Husbandman apple	Dobrni Krestianin
Imperial Citron	Zitsonnoe Zarskoe
Enormous.	Krupneena
Green Crimean.	Krimskaja Selonka
Borsdorf	Borsdorfer.
Sweet Anisette	Anis Sacharnni.
Saccharine Pipka	Pipka Sacharnaja
Blackwood	Tschernoe Drewo
General Greig	General Greig.
Wochin's apple.	S Wochinskoe
Little Seedling.	Repka Malenka
Cross apple.	Skrischapfel
Bergamotte.	Bergamottnoe
Pointed Anisette.	Anis Rospisni
Apple "Lead"	Swinez
Annissim's apple.	Anisimowskoe.
Bosklonoff's apple	Bosklonowka
Round Waxen Arcade	Arkad Krnglni Woskowoi.
Orloff.	Orlowskoe
Saxonian	Sachoiswan.
Pointed	Rospisnoe
White Krim	Krimskaja Beel
Rattling apple.	Grimuschka
Yellow Calville.	Kalville Scholti
Lubsk (name of place) Queen	Reinette Liubski.
Redcheeked apple	Romianka
Queen of Kiew	Ranette Kiluski
Cardinal	Kardinal
Handsome White.	Beel Krasawiza
Warsztappel.	Warschtapel.
Beautiful Arcade	Arkad Krasiwni.
Berry apple.	Riabinouka

NO.	SUGGESTED AMERICAN NAME.	SUGGESTED RUSSIAN NAME.
457.	Kluevskoe.	Kluevskoe
458.	Yellow Naliv.	Jeltui naliv.
461.	Ribbed.	Rebristoe.
462.	Green Rubets	Rubets zelenui.
463.		Pipka postilnaya.
466	Acid Repka.	Reipka kislaya.
467.	Flat Miron.	Miron ploskui.
468.	Painted White	Biel rospisnaya
469.	Grandmother.	Babuschkino
470	Lapouchoe	Lapouchoe.
471	Prolific Anis	Anisovaya plodovitka
472	Ostrokoff	Ostrokosvkays steklianka
475	Shepherd	Pastichovka.
476	Red Arcad.	Arkad krasnui (Rgl.)
477.	Christmas	Roshdestvenskoe.
478	Thin Twig.	Tonkovietka polosataya
481.	Mensk.	Mtsenkoe
490.	Glints.	Glintsovo.
502.	Rambour Reinette	Russkui ramburovui renet.
544	Lapouchoe Naliv.	Lapouchoe nalivnoe.
548	Meadow Borovinka	(Borovinka lugovaya.)
551.	Watermelon.	Arbuzovskoe.
555	Red Sweeting.	Kras sladkaya
557.	Revel Streaked.	Revelskoe polosatoe
558	Early Cinnamon.	Koritchnevoe rannee.
563.	Crimean Naliv.	Krimskoe nalivnoe
565.	Vorgunok.	Vorgunok
566	Large Transparent.	Krupnui skvosnoi naliv
568.	Melonen	Melonenapfel
569	Rosenhager.	Rosenhager.
575	Alabaster.	Alabaster weisser
578.	Leipsic Borsdorf	Borsdorfer Leipsiger.
579	Summer Livland.	(Livlandischer sommer.)
580.	Winter Livland	(Livlandischer winter.)
584.	Erdbeer.	Erdbeerapfel.
585.	Zusoff.	Jussow's winterapfel
587	English Pippin.	Pepping Englischer
592.	Long Arcad.	Arkad dlinnui.
595.	Sweet Mensk.	Mtsenskoe sladkoe.
597.	Sandy Glass.	Pesotchnoe steklianovoe.
599.	Romenskoe.	Romenskoe, also Rommenskoe.
600.	Long.	(Dlinnoe.)
861	Smoky Arcad.	Arkad dimtchatui.
874.	Sweet Borovinka.	Borovinka sladkaya.
962	Muscatel Reinette.	Reinette muscateller.
963	Livland Muscatel.	Muscatapfel Livlander
964.	Autumn Streaked.	(Herbst strefling.

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Klineff's apple	Klinewskoe
Yellow Juice.	Scholtinaliw.
Strong-ribbed	Rebristoe
Green Cut	Rubez Sclonniu
Spreading Pipka	Pipka Postillnaja
Sour Turnip.	Repka Kislaja
Flattened Barbel	Miron Ploskui
Pointed White	Beel Rospisnaja.
Grandmother's apple	Babuschkino
Burr apple	Laponchoe
Prolific Anisette.	Anisowaja Plodowitka
Ostrekoff's Glass	Ostrekowskaja Steklianka
Holdfast.	Postichouka.
Red Arcade	Arcad, Rother
Christ Birth apple	Roschdestwenskoe
Thin Twig Streaked	Tonkowetka Polosataja
Mzensk apple.	Mzenskoe
Clay apple.	Glinzowoe.
Russian Rambour Queen	Russische Rambour Reinnette
Juicy Burr apple	Lapouchoe Naliw
Meadows Mushroom.	Borowinka Lugouaja
Water-melon apple.	Arbusowskoe
Red Sweeting.	Krass Sladkaja
Streaked Revel.	Revelskaja Polosatoe
Early Cinnamon.	Konitschenewoe Rannoe
Juicy Krimtarter	Krimskoo Naliwnoe
Worgunok.	Wergunoks
Large Sub-acid	Kruipnui Skworminaliw
Melon apple.	Melonenapfel
Slender Rose	Rosenhager.
Alabaster White	Alabaster, Weisser
Leipzig Borsdorf	Boresdorfer, Leipziger
Summer Lowland	Tierlandischer Sommer
Winter Lowland.	Tierlandischer Winter
Red Calville	Erdbeerapfel
Zusoff's Winter apple	Zusows Winterapfel
English Pippin	Englischer Pepping
Long Arcade	Arkad Dlinui
Mzensk Sweet	Mzenskoe Sladkoe
Glassy Sand apple.	Pesolschnaja Steklianka
Omensk (name of a place.)	Romenskoe.
Long apple	Dlinoe.
Smoky Arcade	Arkad Duimtschataja
Sweet Mushroom	Borowinka Sladkaja.
Queen Muscatel	Reinette Muscateller
Lowland Muscatel.	Muscateller Tievlander
Autumn Streaked	Herbst Streifling

NO	SUGGESTED AMERICAN NAME	SUGGESTED RUSSIAN NAME.
965	Sweet Pear.	Gruschevka sladkaya
966.	Red-black	Tchernokrasnoe
967.	Zelonka.	Zelenoe
968.	Aloe	Saburovskoe
969	Amber	Yantarnoe
970	Green Stranger	Tchushenka zelenaya
971.	Basil the Great.	Vasilui velikui
972	Overflowing	(Tchereztetchnui.)
973		Stekliannoe duchistoe
974	Rasumoff	Razumovskui moschok
975.	Red Titka	(Titka krasnaya.)
976	Lipka.	Lipka
977.		Tchutilotchnoe
978	Golden White	Biel zolotovskaya
979.	Large Long White	Biel krupnaya prodolgovatnaya
980	White Pelikanoff	Biel Pelikanovskaya
981	White Russet	Bielevoe jeltosieroe.
982	White Skrute	Skrut bielevoi
983	Transparent Astrachan.	Astrachanskoe skvosnoe
984	Kursk Anis	Anis Kurskui
985	Red Anis	Anis krasnui
986.	Green Anis	Anis zelenui
987.	Yellow Anis	Anis jeltui
988.	Pine-apple	Ananasnoe

TRANSLATION (AS PER CATALOGUE.)	RUSSIAN NAME (AS PER CATALOGUE.)
Sweet Pear apple	Gruscheffka Sladkaja
Red-black	Tschernokrasnoe
Greening	Sclonne
Aloe apple	Saburonskoe
Zantar apple	Zantarnoe
Green Citron	Tuhuginka Selomaja
Vasilis Largest	Wassilli Welikui
Overflowing	Trechtrshrommoc.
Shining Aromatic.	Stekliannoe Duschisstoe
Razumoffsky's Downy	Rasumowski Noschok
Red Teat	Tetuekrasnoe
Linden apple	Tipka
Aromatic.	Tuhutilotschnoe.
Golden White	Beel Solotofskaja.
Large Long White	Beel Krupnaja Prodolgouataja
Plikanoff Small	Beel Plikano Uskaja
White Russet	Beelowoe Scholto Seroe
Round White	Skrut Beelowoi
Red Astrachan	Astrachanskoe Skwasnoe
Koursk's (a name of a place) Anisette	Anis Kurski
Red Anisette	Anis Krasnui
Green Anisette	Anis Selanui
Yellow Anisette	Anis Schaltui
Pine apple.	Ananasnoe.

Scions received by the Iowa State Agricultural College from Dr. Regel, St. Petersburg, March, 1879. This collection contained seventy-two varieties. Of these the following either do not appear in the U. S. importation of 1870, or else they appear under other numbers.

NO.	SUGGESTED AMERICAN NAME.	RUSSIAN NAME.
10.		Rigaer herbst streifling.
123.	Revel Pigeon.	Taubenapfel Revaler.
151.	Sugar Miron (368 Dep.).	Miron sacharnui.
170.	Revel Glass.	Steklianka Revelskaya. (Revelskoe of Dep.)
191.	Red Petersburg.	Petersburgskoe krasnoe.
243.	Nicolai.	Nasliednik Nicolai Aleksandrovitch.
239.	Zelenka.	Zelenka.
257.	Arabka (184 Dep.)	Arabskoe.
277.	Lead (277 Dep. is Vargul.)	Svinsovka (is 362 Dep.)
328.	Peterhoff.	Peterhovskoe.
356.	Round Borsdorf.	Borsdorfer runder.
361.	Pointed Pipka.	Pipka ostrokonetchnaya.
379.	Revel Pear (338 Dep.)	Gruschevka Revelskaya.
428.	Fonaric.	Fonarik nalivnui.
540.	Kalkidon.	Khalkidonskoe.
934.	White Aport.	Aport bielui.
1227.	Gipsey.	Tsiganka.
1260.	Red Raspberry.	Malinovka krasnaya.
1277.	Rosy Voronesh.	Voroneshskui rosovui.

NOTES ON THE ABOVE.

No. 10 might prove the same as 964 Dep. Autumn Streaked. 243, Nasliednik Nicolai Aleksandrovitch. I am at a loss for a short name for this. Prof. Jankowski and others give Nicolayer as a synonym, but Dr. Regel never mentions it, neither in his Russian Pomology nor in any catalogue I have seen. Besides this Andre Leroy states that Nicolayer is said to have originated in the Crimea, while Dr. Regel gives the St. Petersburg and Baltic coast provinces as the home of the N. N. A. Prof. Budd suggested "Throne" because that personage was heir to the throne, and I at the time agreed; yet I fear such a translation is so free as to be open to censure. 239 Zelenka may be 967 Dep. Zelenoe. 361 Pipka ostrokonetchnaya, the sharply pointed pipka has been erroneously propagated as the Astrachan Pippin.

SCIONS RECEIVED BY THE IOWA STATE AGRICULTURAL COLLEGE,

From R. Shroeder, Acadamie Petrowskoe Rasumowskoe, Moscow, May, 1879.

	SUGGESTED AMERICAN NAME.	FOREIGN NAME.
1.	Repolovka.	Repolovka.
2.	Hare Pipka.	Pipka saitchia.
3.	Lead.	Svinsovka.
4.	Ostrokoff.	Steklianka Ostrokovskaya.
5.	Royal Table.	Furstlicher tafelapfel.

	SUGGESTED AMERICAN NAME.	FOREIGN NAME.
6.	Grandmother.	Babuschkino.
7.	Osimoe.	Osimoe.
8.	Sweet Cross.	Skrijapel sladkui.
9.	English Borovinka.	Borovinka Angliskaya.
10.	Ukraine.	Ukrainskoe.
11.	Romenskoe.	Romenskoe.
12.	Vargulek.	Vargulek.
13.	Mottled Anis.	Anis pestrui.
14.	Anisim.	Anisimovka (see No. 18.)
15.	Cross.	Skrijapel.
16.	Vargul.	Vargul.
17.	Kruder.	Kruder oder blauer.
18.	Anisim.	Anisimovka (also 14.)
19.	Blackwood.	Tchernoe derevo (also 53.)
20.	Kursk Reinette.	Renet Kurski.
21.	Karabovka.	Karabovka.
22.	Blushed Calville.	Kalvil krasnui (also 82 and 130.)
23.	Aport.	Aport.
24.	Sandy Glass.	Steklianka pesotchnaya.
25.	Dansic Pipka.	Pipka Dantsigskaya.
26.	Antonovka.	Antonovka.
27.	Large Anis.	Anis krupnui.
28.	Kluevskoe.	Kluevskoe.
29.	Melonen (or nun.)	Melonen oder nonnen.
30.	Ledenets.	Ledenets.
31.	Good Peasant.	Dobrui krestianin.
32.	Anis.	Anis.
33.	Winter Streaked.	Polosatka simnaya.
34.		(Label lost.)
35.	(Name lost.)	
36.	(Name lost.)	
37.	White Borodovka.	Biel borodovskoe.
38.	Queen Louise.	Konigin Louise.
39.	Polish Cinnamon.	Koritchnevoe Polskoe.
40.	White Summer Calville.	Kalvil weisser sommer.
41.	Lejanka.	Lejanka.
42.	Bokovoe.	Bokovoe.
43.	Watermelon.	Arbuzovskoe.
44.	Lipin.	Lipinskoe.
45.	Royal.	Korolevskoe.
46.	Early Cinnamon.	Koritchnevoe rannee.
47.	Yellow Kiev.	Kievskoe jeltoe.
48.	Cinnamon Pine.	Koritchnevoe ananasnoe (also 101).
49.	Sweet Mensk.	Mtsenskoe sladkoe.
50.	Swan.	Lebedka.
51.	Avenarius.	Pipka sladkaya (Avenarius) (also 78).
52.	Riga Translucent.	Skvosneena Rishkaya (also 157).

	SUGGESTED AMERICAN NAME.	FOREIGN NAME.
53.	Blackwood.	Tchernoe derevo (also No. 19).
54.	Great Mogul.	Vilikui Mogul.
55.	Red Rukin.	Rukinskoe krasnoe.
56.	Longfield.	Langerfeldskoe.
58.		Gvosditchoe.
59.	Repka Arcad.	Arkad rieptchatui.
60.	Smoky Arcad.	Arkad dimtchatui.
61.	Melonen (or Bell).	Svonkoe ili dinnoe.
62.	Richard.	Grand Richard.
63.	Kolomenskoe.	Kolomenskoe.
64.	Yellow Sweet.	Sacharnoe jeltoe.
65.		Krimskoe vosduchnoe.
66.	Kevel Pigeon.	Revelskoe golubinoe.
67.	Nasiedka.	Nasiedka.
68.	Broad Green.	Nalivnoe zelenui schirokui (also 157).
69.	Early Red.	Skorospieloe krasnoe.
70.	German Prolific.	Plodovitka Niemetskaya.
71.	German Ledenets.	Ledenets Niemetskui.
72.	Sugar Miron.	Miron sacharnui.
73.	Sweet Prolific.	Plodovitka sladkaya.
74.	Green Astrachan.	Astrachanskoe zelenoe.
75.	Silken.	Schelkovka (also 104).
77.	Sweet Streaked.	Polosatka sladkaya.
78.	Avenarius.	Avenariusa sladkoe (also 51).
79.	King's Stripe.	Rotstrahliger Konig.
80.	Petrovskoe.	Petrovskoe.
81.	Mensk.	Mtsenskoe.
82.	Blushed Calville.	Kalvil krasnui (also 22 and 130).
83.	Pear.	Gruschevka.
84.	Bergadorf.	Bergadorvskoe.
85.	Glass.	Steklianka.
86.	Bielgorod.	Bielgorodskoe.
87.	Herren.	Herrenapfel.
88.	Bergamot.	Bergamotnoe.
89.	German Calville.	Kalvil Niemetskui.
90.	Rosy Aport.	Aport rosovoe.
91.	German Skrute.	Skrute Niemetskui.
92.	Svinets.	Svinets.
93.	Vinnoe.	Vinnoe.
94.	Kalkidon.	Khalkidonskoe.
95.	Fonaric.	Fonarik nalivnoe.
96	Juicy Ribbed.	Rubets rebristui nalivnoi.
97.	Marble.	Mramornoe.
98.	Smolensk.	Smolenskoe.
99.	Long Arcad.	Arkad dlinnui.
100.	Putim.	Putimskoe.
101.	Cinnamon Pine.	Koritchnevoe ananasnoe (also 48).

SUGGESTED AMERICAN NAME.	FOREIGN NAME
102. Multicolor.	Pestruchka
103. Striped Calville.	Kalvil polosatui
104. Silken.	Schelkovka (also 75)
105. Charlamoff.	Charlamovskoe
106. Potainoe.	Potainoe
107. Serinkia.	Lehmapfel (Sierianka)
108. Sweet Aport.	Aport sladkui
109. Amber.	Yantarnoe.
110. Translucent.	Skvosneena
111. Cinnamon Anis.	Anis koritchnevee
112. Champagne.	Champanskoe
113. Raspberry.	Malinovka
114. Stepanoff.	Stepanovka
115. Early Translucent.	Skvosneena skorospielaya.
116. Heidorn.	Polosatka Heidorna
117. (Lost. Also 118 and 119.)	
120. Rshev's Miron.	Miron rshevski
121. Poniavinskoe.	Poniavinskoe
122. Beresina.	Berezinskoe.
123. Polish Prolific.	Plodovitka Polskaya.
124. Champagne Pipka.	Pipka Champanskaya
125. Striped Naliv.	Polosatka nalivnaya
126. Early Grandmother.	Babuschkino rannee
127. Yellow Sweet.	Sladkoe jeltoe
128. Lemon.	Limonnoe.
129. Autumn Aport.	Aport osennee
130. Blushed Calville.	Kalvil krasnui (also 22 and 82).
131. Yellow Prolific.	Plodovitka jeltaya
132. Prolific.	Plodovitka
133. White Naliv	Nalivnoe bielui.
134. Titovka.	Titovka
135. Russian Gravenstein	Grafensteiner.
136. Scented White.	Biel duchovoya
137. Repka Aport.	Aport rieptchatui
138. Borovinka	Borovinka
139. Repka	Riepka
140. Czar's Thorn.	Tsarkui schips
141. Tashkin	Taskinskoe.
142. Red Sided.	Krasnobokoe (also 154)
143. Painted Arcad	Arkad rospisnui
144. Marmalade	Marmeladnoe
145. Early Stripe	Polosatka lietnaya
146. Large Prolific	Plodovitka krupnaya
147. Thaler.	Charlottenthalskoe jeltoe
148. Rubets.	Rubets
149. Revel Glass.	Steklianka Revelskaya
150. Visotskoe.	Visodskoe (Visotskoe Rgl)

	SUGGESTED AMERICAN NAME.	FOREIGN NAME
151	Romanoff.	Romanovka.
152	Breskovka	Breskovka.
153	Imperator	Imperatorskoe
154	Red Sided	Krasnobokoe (also 142)
155	Arabka	Arabskoe.
156	Red Naliv	Nalivnoe krasnoe.
157	Broad Green	Nalivnoe zelenui schirokui (also 68)
158	Autumn Streaked	Herbst streifling
159	Crooked Spike	Krivospitsa
160	Waxen	Voskovoe
161	Christmas	Roshdestvenskee
162	Markovka	Markovka
163	Red Miron	Miron krasnui
164	Yellow Naliv	Nalivnoe jeltui

The following apples were received by the Iowa Agricultural College from various sources in Russia

SUGGESTED AMERICAN NAME	RUSSIAN NAME
Early Pipka	Pipka lietnaya
Voronesh Arcad	Voroneshskoe arkad
White Sweet	Bieloe sladkoe
Vinnoe	Vinnoe
White Rubets	Bielui rubets
	Scharik Kremera
Ivory	Simnui biel
Flat Voronesh	Voroneshskoe Polskoe
Voronesh Cinnamon	Voroneshskoe koritchnevoe
Golden Reinette	Zolotoi renet
Rosy	Rosovka
Pyriform	Gruschaobrasnoe
	Jeltoe biel (Fischer)
	Jeltoe biel (Rgl)
Shepherd	Pastichovka.
Bogdanoff	Bogdanoff (Riepka)
Bogdanoff's Glass	Steklianka Bogdanoff
Crimea	Crimea
Russian Calville	Kalvil Ruskui
Persian	Persian
Skrute	Skrute
Neumeister	Neumeister
	Reinette Scharlock
English Pippin (same as Longfield).	Englischer pepping
Livland Muscatel	Muscateller Livlandischer.
Citronen	Citronenapfel
Citronat	Citronat.
	Streifling edler winter
	(Possible 61 Dep. Noble Redstreak)

SUGGESTED AMERICAN NAME	RUSSIAN NAME
Alfriston	Alfriston.
	Moregi.*
Batullen	Batullen
Boiken.	Boikenapfel
Mueller's Spitz.	Mueller's spitzapfel
Baumann.	Baumann's reinette
Grosser Bohn	Grosser bohnapfel
Geflammter.	Geflammter
	Langer gruner gulderling
Red Jungfern	Rother jungfern
Possart.	Possart's nalivia.
Landsburg.	Landsburger reinette.
Yellow Stettin	Gelber Stettiner
	Weisser winter tafelapfel
	(probably Taffetapfel weisser winter).
Red Pigeon	Rother winter taubenapfel
Red Serinkia.	Rother Serinkia.
Nitchner's Strawberry.*	Nitchner's erdbeerapfel
Eiser.	Eiserapfel
Hare's Head	Hasenkopf (Saitchia golova)

Varieties marked * I have been unable to verify in any book or catalogue

PEARS

The following four importations were propagated and distributed by the Iowa Agricultural College at first by number; I therefore give them in full

Pears From Dr. Regel, St. Petersburg, Russia, March, 1879

No.	SUGGESTED FOREIGN NAME.	FOREIGN NAME
121.	Honey	Gliva medovaya,(Honigbirne).
122.	Autumn Bergamot	Bergamot osennui
125.	Bear	Dula medviedevka
345.	Long-stem	Dolgokvostka morosovskaya
347.	Gakovsk.	Gakovskaya
351.	Baba	Grusha Baba
358.	Juicy Gliva	Gliva otschen sotchnaya.
361	Victorina	Victorina mnogoplodnaya.
392	Kurskaya	Gliva Kurskaya.
395	Red Bergamot	Bergamot krasnui
396	Flat Bergamot	" ploskui
418	Early Bergamot	" rannaya
439	Double Beurre.	Maslitchnaya dvoinaya
508.	Seedless	Bessemianka
513.	Thin Twig	Tonkovietka
516.	Lemon.	Limonnaya
520	Sapieganka	Bergamot Sapieganka

From R. Shroeder, Moscow, Russia, May 1879.

No.	SUGGESTED AMERICAN NAME.	FOREIGN NAME
1	Kursk Bergamot	Bergamot Kurski
2.	Goubalt.	Beurre Goubalt
3	Seedless	Bessemianka
4.	Dula.	Dula.
5	Grella	Grella
6.		Krupyanka
7	and 35 Lemon	Limonnaya
8.	Honey.	Medovaya, (Honigbirne)
9.	Winter.	Osinnaya
10	Poltava	Poltavskaya
11.	and 36 *m* and 76 *m*. Sapieganka.	Sapieganka
12	Sacharine	Sacharnaya
13	Strawberry	Semlianitchnaya
14.	Thin Twig.	Tonkovietka
15.	Czar	Tsarskava.

From J E Fischer, Voronesh, Russia, November 10, 1882

No.	SUGGESTED AMERICAN NAME.	FOREIGN NAME
101.	Kurskaya	Gliva Kurskaya.
**102	Seedless	Bessemianka
*103.	Early Bergamot	Bergamot rannui
*104	Autumn Bergamot	" osennui
**107	Bear.	Medviedevka.
**106	Victorina	Victorina
*108	Korsun's Bergamot.	Korsun's Bergamot.
*109.	Scented.	Duchovaya.
*110		Bergamot vsduti.

From P G Tretjakoff, Orel, Russia

No.	SUGGESTED AMERICAN NAME.	FOREIGN NAME.
13.	Seedless.	Bessemianka
14	Green Bergamot	Bergamot zelenui
15		Kositschka (possibly Kostotchka)
16	Waxen	Voskovaya
17	Sugar	Zucherbirne.

The following were received from West Russia, Poland and Germany

SUGGESTED AMERICAN NAME	FOREIGN NAME
White Livland	Butterbirne weisse Livlandische
Large sugar	Zucherbirne grosse
Green Wine	Weinbirne grune.
Junfer	Junferbirne
Pound	Pfundbirne
White Livland	Butterbine weisse Livlandesche
Green wine	Grune weinbirne

SUGGESTED AMERICAN NAME.	FOREIGN NAME.
Princess.	Princessbirne.
Father's Keepsake.	Oicovska
Bergamotte Rouge.	Bergamotte rouge
Duchess Precose.	Duchess precose.
Long Green	Longue verte
Gute Grune.	Gute grune
Polish Lemon	Cytrymova
Pasovka	Pasovka
Pomerania	Pomeranzenbirne
Ogonka	Ogonka
Lutovka	Lutovka
Grumkower.	Grumkower.
Bauvier d'Automn	Bauvier d'automn
White Livland.	Butterbirne weisse Livlandische.
Feigen.	Feigenbirne.
Salzburg	Salzburger.
Warsaw Bergamot.	Bergamotte ordinaire (of Warsaw)
Waxey.	Voskovoya.
Vinograd	Vinogradnui.

PLUMS.

The following two collections were received by the Iowa Agricultural College and have been sent out either by number or name.

From Dr. Regel, St. Petersburg, Russia, Winter of 1881-82

No.	SUGGESTED AMERICAN NAME.	FOREIGN NAME
1	Black Vengerka	Tchernaya vengerskaya
2.	White Nicolas	Bielaya Nicholskaya.
3	Early Red	Krasnaya skorospielkaya

From J. E. Fischer, Voronesh, Russia

43	Yellow Voronesh	
44	Moldavka	Moldavka

The following received from different sources have been propagated by name only

White Otschakoff.	Bielaya Otschakovskaya
White Winter	Bielaya osimaya
Red Winter.	Krasnaya osimaya.
Early.	Skorospielka.
Black Arabka	Tchernaya Arabskaya
Hungary	Quetsche de Hongrie (Zwetsche Ungarische.)
Leipsic	Quetsche de Leipsic (Zwetsche Leipziger).
Green Reine Claude.	Reine Claude verte.
Yellow Aubert.	Dame Aubert jaune
Red Aubert.	Dame Aubert rouge.
Livland	Livlandischer bierflaume

CHERRIES.

Many varieties of Cherries have of late been imported which were hitherto unknown, or but little known in this country. However, except the Vladimir, Bessarabian, Lutovka and the Lyonskaya, which last comes to us with any rate a Russian name, they have German or French names, and so need not be mentioned here.

In conclusion, I would say that we have been in great need of authoritative action in the naming of new foreign fruits. We here have a suggestion to our authoritative body. I have been critical upon what work has been done. I cannot refuse to stand shot. Fair criticism should so far bring to light the faults of this work as to bring about its adoption in modified form at the next meeting of the American Pomological Society.

C. A. GREEN, New York: Which are the most promising Russian fruits for Western New York?

CHAS. GIBB: None of the Winter apples equal the Baldwin, Spitzenburg, or Northern Spy.

W. C. BARRY, New York: Is there any variety much harder than Oldenburg? I have seen that bear well after the thermometer had been down to 40°.

CHAS. GIBB: Those of the Anis type, judging from Russian experience, are hardier.

D. W. ADAMS, Florida: Two years ago I had forty acres of orchard in Northern Iowa nearly all killed except the Oldenburgs. The trees were mostly twenty to thirty years old. I had also some of the Russian varieties of the Department importation of 1870. Of those there was little difference among the varieties of the Oldenburg type. St. Lawrence and Famouse perished. The temperature reached 40°, and remained from 20° to 30° for several days. This removed the moisture from the twigs, so that it produced worse results than a low temperature for a short time would have done. There seems to be something about the bark of the Oldenburg group of varieties which prevents the twigs drying out as much as with other varieties.

CHAS. GIBB: I am growing over a hundred varieties of Russian and German apples, and have in some cases the same variety from different localities in Russia. We cannot expect that these varieties will have the same quality here that they do in latitudes 47° to 55° in Russia. We can only try them and determine what they will do.

NOTES.

No. 265, Pipka gorkaya is literally the Bitter Pipka, but Mr. Schroeder, of Moscow, says it is by no means bitter, and a fine sub-acid apple, which received its name from the town of Gorke, where it originated; and yet if so it should have been named Pipka Goretskaya. 268, Zakoritnoe, which means a dug-out trough, or which might mean a velvety apple, must not be confused with Sacharnaya, Sacharine. 231, Zolotoi arkad, Golden Arcad, must not be mistaken for 188 and 237, Yellow Arcad. 310, Christapfel is a fairly accurate translation of 447 Roshdestvenskoe. 295, Imperial is not in Regel, but might be a translation of 208, Korolevskoe, or of such a name as Tsarskoe. 350 and 554, Lapouchoe, are translated Burr, but Dr. Alexeeff tells me that although (to be more exact) Lapukhoe may mean Burr, yet Lapoukhoe (a distinction I can hardly make in English letters) means Great Ears. This latter is that described by Regel, and I have therefore retained the Russian name. 413, Skrijapel, as it appears in Russian, in

Regel, is translated Cross. The termination "apel" the Russianized form of "apfel" betokened German origin, but Germans would not recognize it, and I had said it was not Cross. It did not then occur to me that it was Danish. 437, Sachoiswan, puzzles both Dr. Regel and Mr. Albert Regel. The name seems unknown to them, and the Doctor can only suggest that it might be intended for Sacharnoe, Sacharine, or perhaps Zakoritnoe. The apple must have a name, so I have retained the name Saxonian. 551, Arbuzovskoe I have left as Watermelon, even though it is named after Mr. Arbuzoff, Mr. Watermelon. 565, Vorgunok, must not be confused with Vargulek or Vorgulek. 584, I have used Erdbeer instead of Strawberry as we have so many strawberry apples. 599, Romnenskoe or Romenskoe? Regel in his pomology gives the former, as coming from Romna, near Moscow; but in his catalogues of late years, he gives Romenskoe, as though from the town of Romensk. Mr. Schroeder, of Moscow, in his Plodovui Sad, in 1886, adheres to Romnenskoe. Mr. Albert Regel says he does not know, but says that Romna is not a fruit growing region, and Romensk is; leaving the chances in favor of the latter. I mention this to show that accuracy is not always possible.

THURSDAY—MORNING SESSION.

Promptly at half past nine, President Berckmans called the Society to order. About seventy-five delegates were present.

T. T. Lyon, chairman of a sub-committee of the Committee on Nominations, presented the following report, which was unanimously adopted, and the Secretary instructed to forward a copy to the retiring First Vice President, Mr. Barry:

The Committee on Nominations learn with great regret that, owing to the feeble health, together with the demands of duty in other directions, Mr. Patrick Barry, the First Vice President of this Society, feels compelled to decline further official connection with it

In consideration, therefore, of his high position as a pomologist, as well as of his long and eminently valuable official services, your committee recommend the adoption of the following:

Resolved, That the long and eminent services of Mr. Patrick Barry, not to this Society only, but to horticulture generally, entitle him to the gratitude of all interested in pursuits of this character.

Resolved, That while we greatly regret the necessity for such determination, we earnestly hope that he may yet feel himself enabled to resume the labors so long and so effectively carried on, and that the Society as well as the public may yet be permitted to profit by his matured wisdom and wide experience.

President Berckmans stated that, owing to the increased number of foreign fruits being introduced into cultivation, the Committe on Foreign Fruits should, in his opinion, be increased to a number equal to that on Native Fruits.

On motion of W. C. Strong, the President was instructed to appoint a committee of three to take the subject into consideration.

The President appointed as such committee, W. C. Strong, of Massachusetts; T. T. Lyon, of Michigan, and Geo. W. Campbell, of Ohio.

On motion of Dr. H. H. Carey, of Georgia, the following amendment, to stand as section nine, was made to the by-laws:

A standing committee on Tropical and Semi-tropical Fruits, consisting of eleven members, shall be appointed, whose duties shall be similar to those of the committee in by-law seven.

The first paper of the morning was then presented:

Relation of Forest Destruction to Fruit Deterioration.

BY GEO. W. CAMPBELL, DELAWARE, OHIO.

When I consented, at the request of our Secretary, to introduce the subject of the "Relation of Forest Destruction to Fruit Deterioration," I felt obliged to do so, under a partial protest, because I have not the happy—or perhaps I should say, the unhappy—faculty of saying most upon matters of which I know the least. And so I consented, with the understanding, that as I had not made the subject one of special study, my remarks should be rather with the object of eliciting information from others, than of giving it myself. That the destruction of our forests has reached a point to cause alarm, we hear from all quarters—and the most obvious effect seems to have been such changes of climate in all sections where the area of our forests has been greatly diminished, that our most valuable fruits which were formerly grown with certainty, can no longer be relied upon. Our winters have become colder, our summers hotter, and all seasons more variable. Extreme and sudden changes of temperature—long periods of drouth, alternated

with violent storms of tempest, rain and hail, appear more prevalent—all of which are disastrous to the successful production of our finer fruits—notably, the peach, the plum, the finer cherries and grapes; and in some sections, even the once hardy apple, is far less reliable than in former years. Especially in the great Northwest, and even in Central Ohio, many kinds of apples that were once grown successfully, have been destroyed when the winter temperature has marked from 30° to 40° below zero—either preceded or followed by sudden changes to several degrees above freezing point. Peaches which thirty or forty years ago were grown with reasonable certainty throughout our whole State, have become, perhaps, the most uncertain of all our fruits. Either the severity of winter kills the trees, or untimely frosts in spring destroy the budding bloom, which may have escaped the perils of winter. In my section, the peach crop has become so very uncertain that scarcely any trees are now planted, except on city lots or in sheltered gardens. I am not prepared to demonstrate that all this is caused by forest destruction; but I do believe it can be largely attributed to it; and I do not know any other which is even probable. I have seen it stated, also, that with the destruction of forests, fungus diseases, which injuriously affect our fruits have largely increased. That pear-blight, and apple-scab, rot and mildew, black-knot and rust, and yellows, are alarmingly prevalent cannot be denied, but just how much of it can be justly charged to forest destruction, I cannot say. The overwhelming increase also, of insect enemies, I think too, renders it more than probable that the destruction of large portions of forest, has driven these pests from their native haunts, where they once found their homes and their sustenance in the wild fruits of the woods—to invade and destroy the cultivated products of our orchards, vineyards and gardens. Either new foes are coming forward continually, or the old ones are seeking new fields of destructiveness. The Curculio, which was once known only as the destroyer of the plum, now marks with his fatal crescent, the peach, the cherry, the nectarine and apricot, as well as the pear, the quince, and the apple. The cultivated crab apples seem especially suited to his taste.

The birds, also, no longer finding their wonted shelter and sustenance in the rapidly diminishing forests, have changed their habits with their change of location, and in many places have become most serious invaders and destroyers of the fruits of our orchards, our berry fields, our vineyards and our gardens.

I may also refer to the water supply, without which successful fruit growing is impossible. Both in the rains and the dews of Heaven, as well as the springs and fountains of our running brooks are believed to be dried up, or diminished by the work of forest destruction; and where this destruction is complete, arid and barren plains take the place of vendure and fertility.

A recent writer in the Popular Science Monthly, says:

"'In two brief centuries, the lumbermen of the United States have destroyed as many trees as the inhabitants of Southern Europe felled in two thousand years.' It is his opinion, again, that unless this deforesting of our hill slopes is stopped, 'the cotton States will be under the necessity of raising their crops by irrigation, while the locust will ravage the plains on the Gulf coast. The soil of the mountain slopes, stripped of their forests, will be washed away by winter rains and thawing snows. Our rivers will become but brooks in the summer, but overwhelming and destructive floods in the spring.' Only sixteen per cent. of our national domain is at present covered with timber, either good, bad or indifferent; and this very small precentage, with our large and

rapidly increasing population, is fast decreasing."

And, on the other hand, I find the following, from another unknown writer, concerning the planting of trees in Nebraska:

"Thirty years ago, the man who traveled forty miles from the Missouri River reached a country which he reported to be uninhabitable. That is all changed now, and one of the influences has been the planting of trees. We feel that in our way we are solving the problem, not of reforesting, as is the case in the older States, but a similar problem, namely, the foresting of a treeless country."

I have, perhaps, said enough to introduce this important and interesting subject to the attention of the Society; and if I shall succeed in bringing out more accurate information from others, who have given it more careful attention, my object will have been attained.

DISCUSSION.

C. A. GREEN, New York: Have we any conclusive evidence that these effects are due to the destruction of the forests?

MR. CAMPBELL: Facts do show that climates have changed, and that fruits we once raised we cannot raise now. In Ohio we formerly raised peaches almost every year; now we cannot get a crop more than one year in ten.

A. S. FULLER, New Jersey: Scientific observations are not always made so that they can be applied in determining questions of cultivation. Meteorological observations show that after a forest is removed about as much rain falls as before, but they do not fully show where it falls nor how long the effect remains. We have reason to believe that cutting the timber lets in the wind, so that the rain does less good; but experiments are rather difficult to make which would prove this.

T. T. LYON, Michigan: This matter presents itself to the people of Michigan in a somewhat different phase from that in other States. We not only have to face the difficulty that lumbermen are sweeping away our forests, but also the fact of extensive and destructive fires originating in the debris left behind. We have Lake Michigan for one of our protections, to be sure, and lumbermen cannot take that; but fruit growers are beginning to learn that the forests in their rear have been a great protection against eastern and northeastern winds. Where the forests have been cut we have found that we get a lower range of temperature with an east wind in winter than we did before.

A. J. CAYWOOD, New York: I think we all have observed that a decrease in the volume of the streams has followed the clearing up of the country.

The next topic was opened by A. L. Hatch, of Ithaca, Wis.:

Apple Scab.

BY A. L. HATCH, ITHACA, WIS.

Apple Scab is caused by a parasitic fungus (Fusicladium dendriticum). The same fungus attacks the leaves, and is then known as leaf blight or mildew. With seasons favorable for its development Apple Scab has been so bad as to destroy the market value of some varieties, and at the same time so injure the leaves as to seriously weaken the trees. We have known it so severe as to render many kinds valueless for general planting, and trees otherwise hardy have Winter-killed after seasons of its greatest prevalence.

The season of 1882 in Wisconsin was of that character. Of about two hundred bushels of Fameuse apples in our own orchards there was hardly an apple not badly scabbed. One hundred trees of Haas, eight years planted, large fine trees, lost three-fourths or more of their foliage during a few moist, hot days in June. Thousands of trees in the nurseries three

and four years old, lost nearly all their leaves by the same cause. The season of 1883 was also very bad, and the effects of these two seasons caused the death of thousands of trees that had too little vitality to endure the cold of succeeding winters. Trees that endured did not recover, generally, to give full crops until 1886.

The development of fungus in the form of Apple Scab and leaf mold, like all other fungi, is most rapid and hurtful in hot, wet seasons. Times of great dryness, however, arrest or entirely stop its growth and it actually occurs that the great drouth of last year and this year in our part of the West has been a great benefit to our orchards. Of course the lack of moisture has been excessive and hurtful in some instances, but the healthy foliage and smooth fruit is very satisfactory.

A very noticeable feature of Apple Scab is the great liability of some varieties to its attacks and the comparative freedom of other kinds The Fameuse and Talman Sweet are very prone to it throughout the West, both in the fruit and leaves. The foliage of the Haas is often severely hurt while the fruit is not so badly affected. The leaves of the English Golden Russet are also very liable to mold or mildew, and to this cause we attribute the loss of two hundred trees in our orchards, from three to five inches in diameter, while trees one to two inches through were very little hurt. At the same time, however, the fruit of Golden Russet isvery free from Scab.

At one time we had fifty sorts of Siberian crab apples and hybrids on trial. Nearly all have proved undesirable on account of the foliage being so hurt almost every year with the Apple Scab fungus. Of the varieties least liable to injury by Scab, Oldenburg and other Russians are very noticeable. Prof. Budd tells us the reason is found in their thick leaves. It may be that the Russian apples have thicker leaves than American sorts, but we think the true reason why they better resist Scab is because of a better protective coating over their surfaces. What we term protective coating is a cuticle of wax that spreads like a film over the cells of the epidermis or outer surface of the leaf. It is also found on the apples, and may be readily scraped off with a knife. On the fruit it gives gloss and brilliancy and on the leaves, especially toward Autumn, it is a glaze or bronze.

Whatever may produce this protective coating of the leaves and fruit, or whatever keeps it entire, will assist in defending against Apple Scab. If, however, it is broken or imperfect then the spores of the fungus find ready lodgment. In one instance, some Talman Sweets that had scabbed badly years before, were heavily manured and gave fine fruit, while trees not so treated scabbed as badly as ever. The same year that we had such scabby Fameuse on thin, exhausted soil, Mr. J. Elliot, thirty miles away, on richer soil, had 1,600 bushels of smooth, marketable fruit.

We have known trees of Fameuse and other sorts to thrive finely and give handsome fruit for many years where but a few trees were grown. It is perhaps accounted for from the fact that spores of the fungus were blown away, whereas had there been more trees near, there might have been a continuous fall of spores from them. We have found that where a single tree might escape Scab for years, a large orchard might be badly hurt. On this plan we have dug out hundreds of crabs and hybrids from our orchards, and have every reason to believe it was a wise thing to do. Perhaps wild apples may also serve as host plants for the same fungus and make it desirable to destroy them, and thousands are found throughout the West. Whatever tree, whether apple or pear, that is subject to Scab, will be an injury to the whole orchard because of its furnishing fungus spores for the winds to scatter over other trees.

It is very natural to ask, what is the remedy for Apple Scab? We have already indicated some possibilities in that direction. Before we can act intelligently in this matter, it is desirable that a full understanding of the life-history of the fungus be obtained. For that we are indebted to Prof. Wm. Trelease, published in the first report of Wisconsin Experiment Station and illustrated from samples obtained from our orchards.

As one remedy, Prof. Burrill suggests spraying with kerosene emulsion. If the vital parts of the fungus are external and in reach of such fungicides it is possible it may be a remedy. If, on the other hand, its growth is internal, like that of peronospora, including grape rot, it will be more difficult to affect it. At one time we scraped off several scabs from some growing apples but they invariably grew again. Now if an entire removal of the outer part of the fungus did not destroy it, could we hope to kill its mycelia or roots in the fruit in any other way? One serious difficulty we have to contend with is the early attack of the fungus while the fruit and foilage are very small and tender, and before they are well supplied with their protective coat of wax cuticle. If in a moist season when Scab prevails, we take a twig of two or three feet of new growth we can notice that the earlier leaves along one half or more of its length are small, weak and defective. This fact points unerringly to seasons of greatest activity of the fungus. More full observations are desirable and experiments can be hopefully tried.

Of course we now know enough of this terrible orchard pest to advise for avoiding it to plant certain kinds and avoid others—to select good soils and sites—to give good culture and proper fertilizers. And above all this, when great drouths prevail, and burning, parching heats wither the herbs of the field, it is then our trees are clad in beautiful foilage and fair fruit. It is then the apple grower should bow his head in gratitude to the Giver of all good, whose dry air and genial breezes so bless pomology.

The subject was continued by Mr. E. S. Goff, of Geneva, N. Y., who said:

In the summer of 1885 I commenced, at the suggestion of Prof. Arthur, botanist to our Station, a series of experiments in the use of hyposulphite of soda for the prevention of the disease of the apple called Apple Scab, and due to the growth of a fungus known technically as Fusicladium dendriticum *Fckl.* These experiments were continued through the summers of 1886 and 1887, and an abstract is now given of the results for the three seasons.

The tree selected for the first trial was a specimen of the common Siberian crab that had been very badly infested by the fungus in previous years. On May 5, 1885, one-half of this tree was sprayed with a solution of hyposulphite of soda at the rate of one pound of the salt to ten gallons of water, and the application was repeated on the same half on May 9 and May 15. During the Summer the effect of the application was visible on the foliage, the leaves appearing less infested by the fungus on the sprayed part than on the other. On September 19 a quantity of fruit was picked from the sprayed part of the tree, and from the part not sprayed; each lot was assorted into three qualities. In the first were put only the fruits not injured by the fungus; in the second, those injured but slightly, and in the third those more injured.

Expressed numerically, the results were in per cents.:

	SPRAYED PART	UNSPRAYED PART	DIFFERENCE
First quality..	21.5	10.	11.5
Second quality.	38.5	29 7	8 8
Third quality.	40.	60.3	20.3

As a further indication of the beneficial effect of the treatment, I add that one hundred fruits taken from the third qual-

ity of the sprayed part of the tree weighed thirteen ounces, while the same number from the part not sprayed weighed but eight ounces, indicating that the percentage of badly infested fruits was not only greatest on the untreated part of the tree, but the extent of the injury upon the affected fruits was also much greater on that part.

In 1886 the same tree was treated in the same manner, except that the solution was applied four times instead of three, viz.: April 22, May 6, May 10 and May 17; the last application being of half the strength of the others.

The results in this case were striking. The sprayed part of the tree bore a fair crop of fruit, while the other part brought no fruit to maturity. Both parts of the tree bloomed profusely, and early in the season both had a fair setting of fruit. When the fruit on the sprayed part of the tree had matured, only specimens ruined by the fungus were to be seen on the other part.

The same applications were made upon a tree of the Seckel pear that had been much infested with an allied species of Fusicladium. The results indicated that about six per cent. of the fruits were saved from injury by the treatment. The past summer the experiment was repeated on the crab tree, and also extended to seven apple trees of the Fall Pippin variety. The crab tree was sprayed seven times, viz.: May 7, 16, 23 and 30, June 4 and 25, and August 22, all at the rate of one pound to ten gallons, except the first, which was of half that strength. In order to make the experiment more complete the treatment was applied to the part that had not been sprayed in the preceding years. The season proved rather unfavorable for the development of the fungus and the fruits were but little injured even on the part of the tree not sprayed. On August 25, a quantity of fruit was gathered from the two parts of the tree, and assorted into three qualities, as before noted, with the following result, expressed in per centages:

	SPRAYED PORTION.	UNSPRAYED PORTION.	DIFFERENCE.
First quality	87.9	71.8	16.1
Second quality.	11.2	25.5	14.3
Third quality	.9	2.7	1.8

The apple trees were sprayed five times, viz.: On May 11, 21, 23 and 30, and August 22. On September 5, a quantity of fruit was picked from the sprayed portions of all the trees and from the parts not sprayed, and each lot was assorted into three qualities, as noted for the crab tree. I give a summary of the results for the seven trees as follows, in per centages:

	SPRAYED PORTION.	UNSPRAYED PORTION	DIFFERENCE.
First quality.	59.1	41.8	17.3
Second quality	36 1	46.6	9.5
Third quality..	4 8	11.16	7.8

The results show clearly that the hyposulphite of soda proved beneficial in every trial, but in no case has it been a complete preventive. In large orchards much infested with the Scab, the good effects of the applications would undoubtedly well repay their slight cost, especially where the trees are to be sprayed for the codling moth, as in that case the only additional expense would be the very slight cost of the salt. On the whole the results offer hope that we may yet be able to combat this disease successfully.

Hyposulphite of soda is a crystaline salt, readily soluble in cold water. It is not poisonous, nor in any sense offensive to use. It may be purchased at the ordinary village drug store in quantities of ten pounds at about six cents per pound, or if ordered in larger quantities from a wholesale house could be had correspondingly less.

Notes upon the same topic, giving observations in Canada, were presented by Prof. D. P. Penhallow, of Montreal:

For the purpose of gaining more exact

knowledge relative to the conditions under which this disease operates, a circular of interrogation was issued during the present season, to various interested persons throughout Ontario, Quebec and Vermont. At the present time of writing, only a portion of the returns are in, but from these, we are able to gather information which, in connection with what is already known, may prove of interest and value.

In notes on this disease, presented by me to the Montreal Horticultural Society at its Winter meeting for 1886, and published in the twelfth annual report of that Society, the following statements of interest at the present time, were made:

"At the time of the last harvest (1886), Fameuse apples of prime quality, commanded five dollars per barrel, while those which were only a little spotted, could be had at two dollars and less, according to the extent of injury. One or two estimates will assist us in forming an idea of the loss incurred from this disease. The orchard of Mr. R. W. Shepherd, Jr., at Como, has a bearing capacity of one hundred barrels. Owing to the spot, however, which affected the entire orchard, the apples were sold for one dollar and fifty cents per barrel, thus representing an extreme possible loss of three hundred and fifty dollars; or if we deduct a reasonable percentage for seconds and thirds, and also allow for unusual prices as determined by scarcity, there would, even then, remain a margin of loss of a most serious nature."

Mr. C. Gibb informs me that in his orchard, which was completely exposed to the prevailing winds, and in which the spot was more pronounced than in any other in his vicinity, the effect was so great that his apples brought an average of only twenty-five cents per bushel, or sixty-two cents per barrel. If free from spot, the same apples would have sold for seventy-five cents per bushel, or in an average year, for more than fifty cents. Out of fifteen barrels he had:

First class	0 barrels.
Second class	1 "
Third class	4 "
Fourth class	10 "

The effect of the disease in diminishing the size of the fruit is most marked. Mr. Gibb states that the diseased apples were to the normal apples, as to size, in the ratio of 1:2 or 1:3, and since the direct loss in price is at least fifty per cent., the actual loss involved in this orchard, is represented by the ratio of 1:4 or 1:6.

Prof. Trelease enumerates thirty-one varieties of apples, which, in the Western States, are subject to this disease. Our inquiries in Canada and Vermont, have so far discovered only six varieties, apart from seedlings, as affected. They are the Fameuse, Mountain Beet, St. Lawrence, Montreal Peach, Canada Baldwin and McIntosh. This list contains three varieties not included in the list of Prof. Trelease, thus making a total of thirty-four varieties which are known to spot. From this it would appear probable that, while certain varieties are known to spot much more readily than others, we can hardly consider any variety as being proof against the disease.

Very few incidental disorders are reported; that which is of the most serious character, and which has been reported by all our correspondents except one' being a splitting of the bark, together with a more or less blighted or "scalded" appearance.

We are as yet unable to trace any relation between the disease, soil, drainage and exposure. These may all exert a more or less important influence in increasing or diminishing the disease, but the testimony thus far at hand, strongly indicates that they are only of secondary importance. While in some cases the disease was well developed in orchards exposed to the prevailing winds, in other cases it was equally prevalent in protected orchards. Similarly, on drained and undrained lands, on gravel, clay and loam,

the disease seems to have made its appearance without much regard to these conditions, or without being much influenced by them.

One very important point determined by our inquiries thus far, is that although an orchard may be very seriously affected one year, it may be wholly free from spot the next year; a fact conspicuously illustrated in the present season as compared with last year. This would tend strongly to show that the disease is in no sense constitutional, and that it is induced by external conditions in which the soil exerts only a subordinate influence. We are therefore led to ask if meteorological conditions are specially favorable to periodicity in this disorder? As yet we cannot give very precise information on this point, as a critical comparison of the most marked appearances of the disease, with a meteorological record the same years and localities will be necessary. A comparisou, however, of the meteorology for 1886 and 1887, during the critical months of May, June and July may afford some indication of what is to be expected:

	1886.		1887.	
	Mean Temp.	Rel. Hum.	Mean Temp.	Rel. Hum
May	54.58	69.7	61.06	57.9
June	63.28	72.2	66 25	70.2
July	67.75	73.2	73.48	69.3

A comparison of these figures with the means for twelve and thirteen years is also of interest in this connection:

	1886 with 12 Years.		1887 with 13 Years.	
	Mean Temp.	Rel. Hum.	Mean Temp	Rel. Hum.
May	54.18	65.6	54.71	65.00
June	64.32	68.4	64.48	68.6
July	68.83	71.4	69.19	71.25

From this we discover a serious appearance of the disease to be coincident with a cold, damp Spring, and its disappearance to coincide in the following year, with a warm, dry Spring, favorable to normal growth. Thus there would appear to be a possible foundation for an opinion held by Mr. N. C. Fisk, of Abbotsford, and expressed to me by him. Speaking of the disease of last year he says that "The Scab, or black spot, on the Fameuse and other apples was caused by the cold and wet weather in the months of May and June (1886). The last May and June (1887), were particularly free from cold and wet weather, and our Fameuse are clean and free from the Scab, or black spots. I think we can safely maintain that the spots on the different apples are caused by cold and wet in the early part of the season, and that the year 1887 has fully proved the fact."

How far this view is really justified can only be ascertained from more extended inquiries, but this certainly appears to be the direction in which the most important results are to be obtained.

The next subject taken up was:

The Improvement of Wild Fruits—An Experience with the Amelanchier Canadensis

BY E. S. GOFF, GENEVA, N. Y.

This superb collection of fruits that we have the pleasure of looking upon here today is not the product of unaided nature. Had the trees or vines that bore these fine samples sprung up in the tangled forests, or on the uninhabited prairie, they certainly would not have borne specimens fit for exhibition. The qualities that make these fruits worthy of so honorable a position are almost entirely due to the aid that man has given to nature. For centuries the horticulturist has labored to assist Pomona. He has encouraged her well-doing by providing abundance of food, and by removing as far as possible the obstacles to her best development. He has pruned her exuberance in unprofitable directions. He has carefully assorted her offerings, sparing only the finest. To-day we are looking upon the cumulative result of all this care and labor.

We do not know what the ancestors of these fruits were when man's intelligence

first prompted him to foster them; but we have every reason to believe that they bore little comparison to their present estate.

Perhaps some of the wild fruits of our swamps, forests or prairies, are as capable of development as were the unimproved parents of certain of these triumphs of horticulture. Perhaps by applying with systematic effort, the knowledge that has been elicited during the past centuries of experience in developing our orchard and garden fruits to some of the more promising among the wild children of Pomona we may find that they too will readily respond to our assistance. The subject is worthy the attention of the experimental horticulturist

It should not be said that we have already enough delicious fruits. The field of the horticulturist is to develop to the utmost all wholesome fruits that can please the palate, and until he has done this, his labor is not completed.

I desire to call the attention of all who are interested in the improvement of wild fruits to the dwarf Juneberry, botanically known as Amelanchier Canadensis. Though very little known in horticulture, this modest shrub springs from a most noble family, being a not very distant relative of the apple, pear and quince. Surely, if high connections are any evidence of merit, this plant is worthy of our respect. My experience with it began in 1882, when a few plants were presented to the New York Agricultural Experiment Station by our esteemed treasurer, Mr. Benjamin G. Smith. These plants, which were well rooted suckers, were set out in a moderately fertile clay soil, and have since received the same cultivation that we give to raspberries. They bore a few samples of fruit in 1883, the next season after setting; a fair crop in 1884, and a bountiful one in 1885. The crop of 1886 was smaller than that of the preceding year, and that of the past season was about the same as in 1885. The plants have now grown into rather straggling shrubs about three feet high, and of equal diameter. The stems do not grow thickly, as in the currant and gooseberry, but are quite spreading. Mr. Smith informs me that with him the plants attain a height of five or six feet. They propogate themselves by suckers from underground stems, like the raspberry, but the suckers do not appear in sufficient numbers to become at all troublesome.

The fruit is borne on small, irregular racemes, on short offshoots of the present year's growth, from old wood, or occasionally near the base of new shoots. It ripens the latter part of June, or just as strawberries begin to fail, and continues in use two to three weeks. When fully ripe it reminds one of very fine samples of the blueberry, being similar to this fruit in color, and in having a persistent and protruding calyx. The larger samples are about half an inch in diameter. It is a miniature pome, with white or faintly pinkish flesh, and its seeds, which bear some resemblance to those of the apple, are soft, and so small as to be scarcely noticeable in eating the fruit. The flavor is mild and pleasant, but not strongly marked. There is no perceptible taste of acid and not the least astringency, but a pleasant sweetness with a faint inclination toward the aromatic, that makes one regret that it is not more pronounced. No one who has tasted the fruit in my presence has expressed a dislike for it, but almost all have been pleased. Several have offered such comments as "good as far as it goes," or "pleasant, but a little insipid," etc. With sugar and cream, the flavor is perceptibly heightened, and some who have tested it in this way pronounce it delicious. To my own taste, with these additions, it is equal to any of the currants or gooseberries, and to most varieties of the cultivated blackberry.

The fruit is sufficiently firm to bear transportation well, and keeps a considerable time after being picked. I have not

yet had the fruit in sufficient quantities to test its qualities for drying or canning, nor have I tried to dispose of it in market. I should expect that if offered for sale, it would soon win for itself at least a small circle of friends.

In the climate of Geneva, the shrub appears perfectly hardy. During the five Winters of my acquaintance with it not a terminal bud appears to have suffered from the cold. The fruit is somewhat injured by the curculio, but usually only slightly. The stems do not appear to be troubled by any kind of borers.

The most promising field of labor in the improvement of wild fruits is doubtless through the production of seedlings, and through crossing with other varieties or species to promote variation. I find from experiment that seedlings of the Amelanchier are very readily grown, by planting the seeds as soon as the fruit ripens, in boxes of compost. I have a number of seedlings now growing that are two years old, and had a large quantity of seed planted the past season. The plants grew rather slowly at first and I judge will not bear fruit until three or four years old.

An important question is, can we hope to improve the flavor of the fruit of the Amelanchier by culture and by selection of varieties? It may, perhaps, be questioned whether if in the process of amelioration, we have succeeded in heightening the flavor of our cultivated fruits over that of their wild progenitors to any great extent. Possibly we may accomplish this end by working toward a darker colored flesh, for I think we may say as a general rule, that in fruits containing little acid, the darker the flesh, the higher the flavor. I propose to follow this clue in my own experiments.

To our Treasurer, Mr. Smith, is due a large share of the credit for introducing this plant to culture. He has kindly furnished me a brief history of it, which I append in conclusion.

Some ten years ago, a description of the Amelanchier Canadensis written by one Dr. Hall, of Davenport, Iowa, appeared in a Western newspaper. Mr Smith immediately wrote Dr. H. asking him if he grew the plants for sale. On receiving an affirmative reply, he at once ordered two dozen and planted them out in his garden. The third or fourth year after this, Mr. Smith exhibited samples of the fruit at the Massachusetts Horticultural Society, receiving a silver medal for its introduction into Massachusetts. Mr. Smith has been informed that the plants grow indigenous in the Rocky mountains. Several varieties of Amelanchier Canadensis are known to botanists, but the one under consideration, designated as "oblongifolia," is believed the most promising for its foliage, flowers and fruits.

In conclusion, I will say that I am desirous of obtaining specimen plants of related varieties of this shrub, in the hope that by crossing them with the variety I am now growing, I may promote variation in the plants. If any member present can aid me in this, I shall esteem it an especial favor.

DISCUSSION.

T. H. HOSKINS, Vermont: The greatest difficulty in growing the Juneberry at my place, in Northern Vermont, is that the fruit is so attractive to birds.

J. T. LOVETT, New Jersey: With me its greatest enemy is the Cedar apple fungus.

A. J. CAYWOOD: Has any one had any experience with the high bush Cranberry?

T. H. HOSKINS: It grows very abundantly in Northern Vermont, but no one cares to gather it. It has a bitter taste, which, however, is partially removed by freezing.

E. L. STURTEVANT, New York: A fruit may be worthless over a large area and yet in a particular locality be of value; Rubus odorata, for example, I have never seen produce a perfect berry in Maine, though it is there one of the most abundant shrubs, but in a certain locality on

Seneca lake, N. Y., it is fairly productive, and yields each year a crop of very promising quality. The Amelanchier, or Shadberry, of Maine, is of no value with us at Geneva, though it has enough points to recommend it for further trial.

H. E. VANDEMAN. District of Columbia: I have been experimenting with the dwarf varieties of Amelanchier for about fifteen years, and I have several varieties growing upon my place in Kansas which are abundant bearers, extremely hardy, and have never been troubled with any fungus. I have sold four to five hundred quarts of the fruit in a season, generally at good prices.

The varieties differ greatly. I have one which I have called "Success," which came from the mountains of Pennsylvania, and which is of unusually fine flavor and very promising.

There is one species of Vaccinium (V. Pennsylvanicum) which it is impossible to transplant with success in the ordinary way. It has to be taken up with the sod. It seems also to require being grown in sod in order to bear properly, as it refuses to bear when cultivated.

T. H. HOSKINS: Does the fine variety mentioned come true from seed?

H. E. VANDEMAN: No sir, there is considerable variation in the seedlings.

The next subject was then taken up:

Promising Wild Fruits.

BY A. S. FULLER, RIDGEWOOD, N. J.

As we can only judge of the future by the past, it may be well in touching upon this subject of "Promising Wild Fruits," to casually glance at those kinds which have passed their days of juvenile promise and now take a front rank far in advance of their senile competitors from the old world.

For more than two hundred years immigrants from Europe brought with them the varieties of the grape with which they were best acquainted, never doubting for a moment their success in this country. Persons born in the United States imbibed the same idea, ignoring and neglecting the native varieties and species, rarely attempting to cultivate them or believing they were worthy of the least consideration. It is barely fifty years since vineyardists were awakened to the fact that we possessed native grapes worthy of cultivation, and even when such varieties as the Catawba and Isabella were discovered, their importance and intrinsic value were far from being fully appreciated. But true merit triumphed, and to-day we no longer seek foreign varieties for our vineyards, their worthlessness for open air culture in the Eastern States has been fully determined by long and bitter experience.

It is true that there is yet room for improvement in our native grapes, but they have long since passed that stage which might be called "promising," and we may rest assured that our native varieties have acquired a permanent position among the most valuable fruits of the country.

THE RASPBERRY.

This is another of our wild fruits which has, despite long neglect and bitter opposition, worked its way to the front, driving its foreign competitors out of the garden, field and markets of this country. There are, no doubt, many members of this Society who can well remember the time when no variety of the native Red Raspberry was considered worthy of mention in our catalogue among either cultivated or promising fruits.

We have only to glance over the record of our own work to see how rapidly opinion may change in regard to the value of any kind of fruit.

In the Catalogue of Fruits given in the transactions of this Society, 1852, only four varieties of the raspberry are named, and these all foreign. Ten years later (1862) three native varieties are named, two Black Caps and one Purple, the latter

known as Catawissa, no native Red Raspberry having as yet been admitted. A half dozen years later, or in 1868, no change in the list had been made. Nine years later (1877) several varieties of the Black Cap raspberry had been added, also three native red varieties, viz.: Herstine, Susqueco and the Turner. In the last published Catalogue (1885) there are thirty-seven varieties of different species named, twenty-five of which belong to our wild, indigenous species, the remainder are either foreign or seedlings therefrom.

It is now quite evident that we have no further use for any variety of raspberry of European origin, for every merit and desirable quality known to belong to this genus have been developed and secured in our pure native varieties.

THE STRAWBERRY.

The history of strawberry culture in this country is almost identical with that of the raspberry, no real substantial progress having been attained until we began to employ the wild varieties as a foundation upon which to build a substantial structure. It may not be complete, but it is grand in all its proportions, and eminently satisfactory except to those who are born to grumble.

THE BLACKBERRY.

Our native blackberries seem to have been turned out from the hand of the Creator in a very perfect state, and we have had only to select the best, cultivate and propagate at will, and to an almost unlimited extent. The best varieties are good enough, still, there is a possibility of some slight improvement in certain directions.

SERVICE BERRY, OR JUNEBERRY.

The dwarf varieties of the Amelanchier Canadensis have recently been cultivated as a garden fruit, and they are certainly deserving of far more care and attention than they have heretofore received. The species is an exceedingly variable one; the typical form is a tree growing thirty to forty feet high, with a stem one to two feet in diameter, and from this there are regular descending grades of natural varieties, until we reach a low, slender shrub rarely growing more than three or four feet high. It is among the dwarf forms that we find the largest fruit and most productive plants. To improve this fruit we must resort to seedlings from the largest and best to be obtained, and then continue selecting the best from each succeeding generation. The size of the berries may be somewhat increased by grafting the dwarf varieties on strong, healthy stalks of the tree form, or on crab-apple stalks. In some localities the fruit is said to be attacked by a species of fungus, but in my grounds it has never been affected by diseases of any kind.

THE CURRANT.

The Missouri currant (Ribes aureum), yields a number of very distinct varieties some of which produce larger and much milder flavored fruit than the black currant of Europe. The plants are notably very hard and prolific, and I have not been able to discover any good reason why this native wild fruit should not be readily and greatly improved by cultivation and the raising of new varieties from seed.

THE GOOSEBERRY.

Long experience in the cultivation of the foreign varieties of the gooseberry has shown us that we cannot depend upon them for general cultivation in this country, while the native varieties seldom fail to yield a bountiful crop. Our native varieties, however, are not of the best flavor nor of large size; consequently we may place them in the list of wild fruits which promise to yield something better.

THE HUCKLEBERRY.

The high bush or swamp huckleberry (vaccinium corymbosum) is probably the best of our native species. Although found most abundant in low moist soils it

is often quite common on high and dry sand hills and stony ridges. The idea seems to have become quite prevalent that this species of the huckleberry will not thrive in ordinary dry garden soils, but I have not been able to trace the error to any trustworthy source or to those who have any considerable experience in its cultivation. The bushes are as readily and safely transplanted as other hard wooded shrubs, and require no more care in cultivation than the current and gooseberry. The varieties may be readily propagated by larger, and new ones may be raised from seed.

THE PERSIMMON.

Among the larger kinds of our neglected, but promising wild fruits, the persimmon should be placed very near, if not at the head of the list. It is a beautiful, hardy and productive tree, well worthy of a place in every collection for ornamental purposes if for no other. Excellent wild varieties exist, which if secured and propagated would soon become popular and in demand among persons who are at all familiar with the taste of a thoroughly ripened persimmon. The recently introduced varieties of the Japan persimmon show very conclusively what may be done with our native species by bestowing upon it proper care and attention. The best of these Japanese varieties are to my taste far superior to the best of the European plums, and I have only to regret that they are not hardy in our Northern States. But by raising hybrids between the Japan varieties and our best natives, we shall without doubt produce a hardy race adapted to general cultivation.

THE PLUM.

The wild plum calls for only a passing notice, as it is well on the way to become one of the most desirable of cultivated fruits and we may reasonably expect that like the raspberry and grape, it will soon drive its foreign competitor out of the field and market.

THE CHERRY.

The foreign species and varieties of the cherry succeed so well in this country that we have had little need of paying much attention to our indigenous species. The most promising species of wild cherries are the wild red cherry. (Prunus Pennsylvanicus) and Dwarf cherry (P. pumila.) These two species have the same inflorescence as the common cultivated varieties of European origin, and by hybridizing and crossing it is possible to produce a valuable and hardy race of cherries quite distinct from any now known The dwarf species is an excellent subject upon which to experiment, for it is not only exceedingly hardy but the plants are most wonderfully productive. The fruit is of large size for so small a plant, but it is rather inferior in flavor.

THE PAPAW.

For large size, productiveness and luxurious growth of tree, the papaw ranks high among our promising wild fruits. It is not naturally as variable as the persimmon and it will probably take a much longer time to produce desirable varieties, still, this is merely conjecture as experiments are wanting to show what may be done with the papaw. There are several species and varieties with which to begin experiments, and is is quite probable that some of the tropical members of this family may be made available in improving the flavor of our wild species. What has been done with our wild fruits should be sufficient incentive for further and more numerous experiments in the same direction.

DISCUSSION.

W. C. BARRY, New York: Do you think the improved American raspberries contain foreign blood?

A. S. FULLER: I cannot trace one of them to any such source. Nearly all seem to be accidental varieties.

W. C. BARRY: Does not the Herstine contain foreign blood?

A. S. FULLER: Its origin is not well known.

W. C. BARRY: How about the Orange?

A. S. FULLER: It originated in this country from pure American blood. The origin of the Golden Queen has been asked for. I believe it to have originated as a sport from the Cuthbert. I have seen a stool of Cuthbert bearing a cane of that variety.

President BERCKMANS: Four or five years ago when the Cuthbert first came around, we had nothing in the way of raspberries that we could depend upon. That variety brought a new era in fruit culture to the South. Now our markets are filled with raspberries, and we have sent Cuthberts from Georgia and sold them here in Boston for seventy-five cents per quart.

T. H. HOSKINS, Vermont: A gentleman on my right suggests that the birds may carry the seeds of our cultivated European varieties, so that the chance seedlings found, may often be of European origin.

A. S. FULLER, New Jersey: A botanist would have no difficulty in detecting foreign blood if it were present.

J. T. LOVETT, New Jersey: I have several promising seedlings of Ribes aurea. This species is not troubled with the currant worm.

E. L. STURTEVANT, New York: I have in a lot of seedling gooseberries, an interesting case of atavism. There are five rows, each from seed of a single cultivated variety, yet in each row you can pick out plants exactly resembling the wild gooseberry of the woods. The same holds true with strawberries and other plants. By this law of atavism we often recover lost varieties; in fact, we rarely originate a variety which has not occurred before. Not long since, I had a valuable variety of sweet corn, which I had originated myself. I afterward found that the same thing had been originated before, and was for sale by seedmen. Many of our supposed new varieties have existed unrecognized in the wild state. One can pick out as many varieties of the raspberry in the woods of Maine as in a modern garden.

W. C. BARRY, New York: I do not think there is any department of horticulture in which so much progress has been made as in the raspberry. Up to the time of the introduction of the Cuthbert the only fine raspberries were foreign sorts. Still, with all the good points that the Cuthbert has, I do not think it is equal to some of the foreign varieties in regard to quality.

Geo. W. Campbell, of Ohio, then presented a cordial invitation from the management of the Ohio Centennial to meet in connection with their great anniversary celebration during the Autumn of 1888, and if convenient arrange the date of meeting to occur during the week which will be devoted especially to horticulture.

On motion of Mr. Chas. A. Green the invitation was accepted.

Mr. W. C. Strong, chairman of the committee appointed to take into consideration the suggestion of the president regarding the committee on foreign fruits, recommended the adoption of a new by-law, to be known as Section 9, which will provide for a committee on tropical and sub-tropical fruits.

On motion of Dr. Samuel Hape, of Georgia, the recommendations of the committee were adopted, and the amendments to the by-laws made as recorded on an earlier page in this volume.

Mr. H. E. VanDeman, of the Department of Agriculture, stated that Commissioner Colman had requested him to deliver to the Society his regrets at not being able to be present at the meeting.

Mr. Chas. Gibb, of Quebec, then introduced the subject of the method of designating the relative value of the varieties in the catalogue. He suggested that the numbers one to ten be used instead of stars as at present.

Mr. J. T. Lovett said that such was the method adopted by the New Jersey Horti

cultural Society, but that it involved a large amount of work, and that it would be next to impossible to do the work thoroughly in a catalogue for the whole country.

H. M. Engle suggested that the standard given by the different State Societies be adopted for that State in the catalogue of this Society.

A. S. Fuller: I think it would be much better to take the rating of a State Society than that of the Chairman of our State Fruit Committee.

T. T. Lyon: In Michigan the varieties are graded for the different sections of the State. It would be impracticable to adopt that plan in our catalogue.

On motion of Mr. D. W. Adams the question was referred for consideration to the Committee on Revision of Catalogue.

THURSDAY EVENING SESSION.

The Society was called to order at 3 P. M., and listened to an address by Dr. Lintner, of Albany, New York, which will be found on a later page. The next paper presented was as follows:

Is the Deterioration of Our Small Fruits a Necessity?

BY J. M. SMITH, OF WISCONSIN.

When the Great Father over all placed man upon the earth, he gave him reasoning powers to aid him in subduing noxious weeds and plants, as well as to aid him in cultivating and improving such as were necessary to his existence and happiness. He also made what we call natural laws, some of which, if carefully observed, will do much to aid us in our efforts to attain to what we term a higher and a better civilization; for, I hold that he who produces, or is the means of producing, a better variety of fruits than those now in existence, or aids others to better care for and protect those already in use, is aiding in the civilization of our day, and adding no small sum to the happiness of our race.

Nature improves very slowly in vegetation, so slowly indeed that in many respects she seems to be stationary. For instance, we have no reasons for believing that the wild strawberry of to-day is either better or worse than it was two thousand years ago. The giant oaks of England, under the boughs of which the Druids performed their religious rites and ceremonies when Julius Cæsar, with his Roman legions, invaded England, were no better or worse than some that may be found there to-day. The system of rotation in wild plant and fruit life is very plainly indicated. When a pine forest is cut off or destroyed, it rarely reproduces itself, and when such is the case, the second growth is far inferior to the first. But let such deciduous trees as are adapted to the soil and climate start, and they will grow with great rapidity. Let the forest be destroyed, but the land left uncleared, and thousands of acres of red raspberries will make their appearance. After a term of years they will be followed by black caps. These in turn by blackberries. All of them to disappear in time and give place to something else. Wild strawberries that, in my young days, were plenty in some of the unplowed meadows near my native home, disappeared many years ago, but have reappeared during the last few years.

I am convinced that the more thoroughly we investigate this subject, the more firmly we shall be convinced that

though our wild fruits and plants may not improve to any perceptible degree, still they do not die out and become extinct. When they are once placed here they are here to stay. They hold their own, and are not annihilated by their Creator.

One point farther: among our wild fruits we find that those that have the best soil, the purest air, the most sunlight, are invariably (other things being equal) the largest and finest fruit. What is this? and why is it?

Is it not the very plants themselves saying to us in their silent but expressive language, "Give us better care. Treat us more tenderly. Give us a better chance than we can have in these tangled woods and wild meadows, and we will yield you more delicious fruits and in larger quantities than you have ever known." Now the question comes to us, if we do this, and pursue some course that will result in some improvement in the plants and their fruit, will the improvement remain with us, or will both plant and fruit degenerate, and in a few years die out or become extinct. It is an undeniable fact that many of our improved plants have, after a term of years, failed to produce fruit in as large a quantity, or of as good a quality as when they were first brought out.

Why is this? Is it a necessity, or is it only the result of our own mistakes, and neglect in the cultivation and care of the improved plants?

If it can be shown to be the latter, then we shall have made a great advance in our ability to hold on to that which is good, until we are certain of something that is still better. What is an improved strawberry plant? We will take it as our standard, and the same laws which apply here, will hold good throughout the list of our small fruits. We shall all agree that it is the result of a much higher cultivation, or perhaps, a higher civilization would be the more appropriate term than it can receive in its native condition.

Now let it be remembered that its tendency is to return to its native state, or at least to go backward. This can be prevented only, by keeping up the character of the plant to as high a standard as that from which it was originally produced.

If the principles here laid down are true (and it seems to me that they are so evident that they need no argument), we here find one of the causes, if not the grand cause, why so many of the new varieties of fruit that are yearly introduced to our notice, prove to be nearly or quite, entire failures when carried away from their native homes. These new varieties, or at least, very many of them, are petted to the last degree.

The soil upon which they stand is surface drained and underdrained. It is plowed and sub-soiled. It is fertilized with anything and everything that will stimulate their growth. The plants are cared for almost as a mother cares for her new born babe, and with the following result: There is a magnificent showing of very large fine looking, but in reality very feeble plants. The fruit is beautiful and perhaps immensely large; but both plants and fruit are produced under a system of cultivation and stimulation combined, that the ordinary grower cannot possibly keep up, and the result is either partial or absolute failure to nearly all who attempt its cultivation. We have all seen this over and over again. Thousands and tens of thousands of amateurs have yearly paid out their money for some new and widely advertised variety, and spent time and money in caring for their little pets, and at last discovered that they had lost both time and money. They became discouraged and concluded that they did not know how to raise berries. The result is that thousands of families all over our country, do without the small fruits, because they verily believe that none but those who are thoroughly skilled in the business can be at all successful in growing them. But here I am liable to be met with the following objection. The case you have stated

does not fit in all cases by any manner of means.

There are varieties that have been widely disseminated and have stood the test for many years, and then have failed. If there is no necessity for their deterioration, how do you account for the plain and undeniable fact, that some varieties have become almost worthless in many portions of the country where they did well for many years? This is a fair question and should be answered.

Suppose we consider the history of Wilson's Albany Seedling for a few moments. This plant had without doubt the strongest and most marked individuality of any strawberry plant that has ever been sent out in the United States, or perhaps in the entire civilized world. It seems to be perfectly at home, whether upon New England hills or valleys, or upon the more Southern Atlantic coast. It flourished equally well upon the cleared timber lands of the West, or upon her broad prairies. It nestled beneath the snows along the shores of Lake Superior during an almost Arctic Winter, while at the same time it was bearing its load of ripening fruit along the shores of the Gulf of Mexico. It seemed to be first and foremost everywhere, and under all circumstances. I believe it was in 1861 that it was first seen in our Western markets. In 1863 it took almost entire possession of them; and for many years scarcely a case of strawberries except the Wilson could be found. The country became flooded with new varieties, and in hundreds of cases the highest commendation the owner could give his new candidate for public favor was to tell us that it was of better quality than the Wilson, and its equal in all other respects; or that it had some other one quality equal to the Wilson and its equal otherwise.

Previous to its introduction, strawberries were confined to the tables of the favored few; but this modest, beautiful little plant created such a revolution that it soon became possible for almost every one who had a home, however humble it might be, to have his or her little bed and have a full supply for themselves and family during its bearing season.

This state of things continued until 1880, when reports began to be circulated that it was failing, and in many portions of the country it no longer bore as in former years. These reports increased in number until it is now evident that, in at least many places, it can no longer put forth, undisputed, the claim to be the Queen of our small fruits. Now the question comes to us, why has it deteriorated, and in so many cases almost entirely failed?

Gentlemen, in the farther discussion of this subject, please allow me, whenever necessary, to refer to my own practice, without considering me either egotistical or self-conceited, as I can illustrate what I wish to make plain, by so doing, better than in any other way. I have already stated that new varieties must be kept up to at least as high a condition as that where they originated. What are the requirements of the Wilson? One of them is very rich land. A second one, it should be kept entirely alone, as it is not as strong a grower as most other varieties, and is very liable to be over-run and choked to death. The beds need to be renewed nearly or quite every year, because of the fact that where they do something near their best, the vines are so exhausted by their crop that they will yield themselves a prey to the first enemy that attacks them (which, with me, is the brown rust), that they will either lie down and die or become so enfeebled that they will be nearly worthless for further cultivation. Another requirement is a change of soil. I have rarely, if ever, known them to do well, when reset on old beds turned under. Other wants might be named, but these are absolute necessities. Have they been complied with? Only in rare cases. On the contrary, the custom has been to get

cheap plants, so cheap, in fact, that no one could possibly afford to grow good ones at the prices for which they were sold. I have seen them packed for shipping, when, if I had wanted to buy, I would not have furnished ground room for such plants, if the owner would have given the plants and cultivated them, and given me the crop for the use of the land. A fair yield in such cases is simply impossible. These poor, sickly plants, have been set in poor, half prepared land. Sometimes set with other and stronger growing varieties, and left to struggle for life with them. Sometimes half cultivated, and sometimes not. Often left unprotected during our cold and hard Winters. The freezing and thawing of early Spring either starts the roots from their places or breaks them off in the frozen earth beneath, either one of which is almost ruinous to the plants. The heavy Spring rains are allowed to run off the beds, or remain upon them, as best it can, without aid or care from the heedless owner. At the picking season these poor, half starved, dwarf plants yield one-fourth or possibly one-half of what ought to be considered a moderate crop.

They are then left to struggle along through another year, when in addition to the enemies already named, there are the white grub and the brown cut worms at their roots, and the leaf roller among their leaves, and a species of wire worms in the crowns of the plants, beside other enemies that might be named, all adding their strength toward the destruction of the already enfeebled plants.

The second season comes, and the yield is less than the first year. Perhaps they are left for the third year, with the hope that a kind Providence will in some way step in and furnish a crop. Vain hope. The result is almost an utter failure. Now, something must be done; and what is it? Some poor, feeble and sickly runners put out from these diseased and dying plants and attempt to perpetuate themselves by making new plants. These new plants, worthless as they are, must be and are used to set new beds, where they are again left to repeat the process already described. Perhaps the parent beds are plowed under and they are reset upon them.

Thus has this forlorn and wretched process gone on for nearly thirty years until at last the cry has gone forth all over the country that the Wilson is no longer a success. It is a failure and some new varieties must be substituted in its place.

Under such treatment could this, or indeed any other variety of our small fruits do otherwise than fail? My only surprise has been, that it did not fail much sooner than it did, and it has been owing to its almost marvellous vitality that it did not.

Time and again as I have stood over my beautiful beds when they were in full bloom, and the bright green leaves, and the tens of thousands of white blossoms, apparently struggling with each other for the mastery, or when they were laden with fruit, I have said to myself, you beautiful little pets, I wonder that Providence in his rulings has not allowed you all to die outright, and become extinct, to punish us for our ignorance, neglect and stupidity in caring for you. We will now suppose a different course of treatment.

Young, strong and healthy plants are obtained and set in ground that has been not only drained, but as thoroughly prepared as the owner knows how to prepare it. The land naturally rich, is made more so, by being heavily manured. After being set, they are watched and tended with the utmost care. The blossoms are all picked off the first season. This does much toward aiding the plant in perfecting its growth, and preparing itself for a large crop the following year. When they commence throwing out runners, they are trained like the spokes of a wheel, the parent plant being considered the hub. No two of them being allowed to take root in the same place. This, while it

really gives us a larger number of plants, also gives us much better ones.

When Winter sets in, they are covered and put into Winter quarters, the owner feeling sure that they will awake to renewed life and activity with the return of the following spring. During the entire season they have been watched with jealous care. They have been examined over and over again for spurious plants. If one has been found, it was destroyed as ruthlessly as if it had been a Canada thistle or some other of the most noxious of weeds. If the owner wishes to set new beds the following Spring, he selects the choicest of plants from these young beds, and never from the runners of plants that have been enfeebled by bearing an immense crop of fruit. The beds are rarely allowed to produce more than a single crop. New beds are never set upon old ones just turned under; but upon land that has been thoroughly cultivated for a number of years just previous to its being set. In this way they escape the whole horde of grubs, worms and insects that prey upon and ruin his neighbors beds. Upon such beds they have neither time, opportunity, nor place for breeding purposes. Gentlemen, is there a person present who believes that under such circumstances the plants would either have failed or become in any manner deteriorated? I think not.

Such has been substantially my own practice for many years; and if any one of you should visit those beds, beautiful as they are in spite of the terrible drouth they have had to contend with, and say to either of my sons now in charge, your Wilsons are failing, they are fast giving out and you must look for other varieties with which to replace them, I am sure they would be neither rude nor ungentlemanly to you, but would quickly ask themselves the question, is this gentleman an escaped lunatic, or is he only a fit candidate for the asylum nearest his home.

A few words as to the practical results of this cure may not be amiss in deciding the question whether they are or are not failing.

I first obtained the plants in 1861. The crops from them have been uniformly from large to very large, except when reduced by my own ignorance or stupidity, or both. In 1875 I measured off an exact quarter of an acre, and found by keeping an accurate account that the yield was 3,175 quarts, or at the rate of 446½ bushels per acre.

In 1876 a quarter of an acre yielded a very small fraction less than 100 bushels. These were both fair seasons for the vines to do well.

In 1886, during the most severe drouth ever known in that portion of the State unless we except 1887, three and one half acres averaged over 250 bushels per acre. During the season just passed, and one of the most unfavorable ones for strawberries that I have ever known, having in the Spring while they were in full bloom a cold damp East wind, that blasted a great many blossoms, and then a very severe drouth that shriveled the fruit, the latter followed by a week of showers at the rate of three or four per day, and accompanied by the most excessive heat, which rotted and otherwise destroyed thousands of quarts, in spite of every effort that we could make to save them.

Yet, in spite of all these drawbacks, a plat of exactly three acres yielded 21,394 quarts, or 223 bushels per acre. A small plat of Wilson, Manchester and Crescent, were tested side by side, with a view of ascertaining the value of different kinds of fertilizers upon them. In this case the aggregate result was as follows: Manchester yielded at the rate of 232½ bushels per acre; Crescent at the rate of 235 bushels per acre; Wilson at the rate of 273¾ bushels per acre. In this case the variation is at the rate of about forty bushels per acre, in favor of the Wilson. The simple fact is that my sons as well as myself consider the Wilson as larger, bet-

ter and stronger plants than when I first obtained them in 1861.

I have repeatedly obtained new plants from prominent growers and set them near those of my own growing, but never allowing them to get mixed. In every case they failed to do as well as those of my own growing, and were destroyed.

Gentlemen, do not all these facts point very strongly in one direction, and that in favor of the perpetuation of our small fruits, provided we do our own work as it should be done. If we do not do it well, we must suffer the penalty.

The law in this case reads about as follows: Give each plant such soil, plant food, care, and cultivation as will enable it to do its best, or suffer the consequences. It will not do to plead ignorance, want of time, want of fertilizers; in fact no excuse is accepted. The rule has been broken and the effect of it is charged up to us, and deducted from the crop. I believe this law to be as invariable as the law of day and night. It bears upon the just and unjust alike.

I once knew a very fine Christian gentleman who was engaged in business and whose notes were constantly coming due at the bank, and himself as constantly without the money to pay them. I once spoke to him upon the subject, and he replied by saying that he had full faith in Providence, who, he was sure, would not allow him to be ruined. Such faith seemed to me to border upon the sublime. Still Providence worked no miracles to save him, and he was soon driven out of business a bankrupt, and so remained until the end of his days. Neither will Providence work any miracles to save our plants and fruits, no matter how strong our faith may be. Neither will ignorant, awkward and stupid labor save them, no matter how much of it we may perform, or how honestly and earnestly we may perform such labors.

On the contrary, intelligent, skillful care and cultivation will, as I firmly believe, not only save, but improve them. I can see no signs among nature's laws that tend toward the dying out of our favorite fruits and plants. Neither do I believe there is a law which virtually says to us, work on, use your utmost skill to bring out new and better varieties of fruit than now exist. You shall be rewarded by having many new varieties, some of which shall be better and more beautiful than any ever yet seen upon the earth. After all, neither you nor your children shall enjoy the fruits of your skillful labor and toil for more than a few years. I will cause it to deteriorate and in a few years to either become worthless or to entirely pass away. Its beauty shall fade from your sight. Its fruit shall cease to be a joy and delight, but shall become like the apples of Sodom to your taste.

That our fruits have in many cases failed after a few years, and many others have from the first failed as soon as carried from their native homes, is beyond dispute. But that it has been a necessity, and in accordance with the laws that are irrevocable, and entirely beyond our control, I do not believe. But upon the contrary, as I have tried to show, they are the results of our ignorance, our want of skill and knowledge in their care and cultivation.

A. J. Caywood, New York: I believe that Mr. Smith has done more to teach us right methods of cultivation than any one else in the country; but that old varieties do not die out, but can be preserved by proper cultivation, is, I think, contrary to our experience. There is a time when all varieties die out. The Wilson now fails here where it originated. I think there is something in the Northern climate which has kept the Wilson from failing with Mr. Smith.

President Berckmans: Our most valuable strawberry in Georgia is the Wilson.

Samuel Hape, Georgia: I have cultivated the Wilson for fifteen years, and I

can see no deterioration where it has been carefully cultivated, and the genuine Wilson has been grown. Strawberry growing is my leading industry. I used to grow only the Wilson, but now use Wilson, Sharpless and Crescent.

The President announced that the Treasurer desired that there be a Finance Committee appointed to take charge of the funds of the Society.

J. H. Bourn, of Rhode Island, moved the following, which was adopted by a two-thirds vote:

The by-laws shall be amended by inserting an article to stand as article 4, which shall read as follows: There shall be a Finance Committee of three members appointed by the President at each biennial meeting. The numbering of the succeeding by-laws shall be altered as required for the insertion of this article.

IN MEMORY OF MARSHALL P. WILDER.

S. B. Parsons, Chairman of the Committee on Resolutions, presented the following:

WHEREAS, It has pleased the Ruler of Events to take from us our honored President and valued associate and friend, the Hon. Marshall P. Wilder. Therefore,

Resolved, That we place upon record our high appreciation of his character and of his valuable services to our Association. His well tried integrity, his uniform courtesy, his executive ability, united with capacity for work, his exceptional readiness with either tongue or pen, his liberality with money, his dignified presence, and the warm sympathy of his nature, were qualities which claimed for him our highest regard and affection. The death of such men is an irreparable loss to every interest for which they have extended the best energies of their lives, and all of us who have known him must always remember with pleasure, mingled with sadness for their loss, the exceptional qualities of his eminent personality.

Also the following:

WHEREAS, Since our last meeting we have to mourn the loss of one of the most valuable officers of our Society, Mr. Charles M. Hovey. Therefore,

Resolved, That we record upon the pages of our history the memory of his great usefulness and of his devotion to the interests of Pomology. Men who have thus labored are hard to replace, and the want of his services will cause us long to remember them.

The resolutions were adopted and the Secretary instructed to send suitable copies to the relatives of the deceased members.

THURSDAY EVENING SESSION.

The first paper of the evening was the following:

COMMERCIAL FERTILIZERS.

A. Affecting the vigor and Health of the Plant, and the Yield and Quality of the Fruit.

BY P. M. AUGUR, MIDDLEFIELD, CONN.

If, in fruit culture, we would have satisfactory returns, there must be a corresponding investment; if the soil deposit be ample, our draft will be honored.

Hence the need of appropriate culture and fertilization. The latter is the question assigned to me. Yet the good effects of abundant fertilization are so much dependent upon good culture, that I venture a few remarks of a general nature on culture.

1. The water table in the earth should be so lowered by drainage, if need be, as to secure sufficient friability and a sufficiently high temperature.

2. The surface and subsoil plows, and later in the season the cultivator and hoe, must be used. Stir the ground deeply enough and frequently, to so aerate the soil, as to give it its maximum power to nurse and feed the tree or plant in question.

Now, with the proper texture and tilth in the soil, comes the question of added

fertility by manures or fertilizers; and here let me say, nature has her limitations. When stoves were first introduced, a man said to his neighbor, "I have bought a stove and it saves half my fuel." His neighbor (a wag) said to him, "Then I will buy two stoves and save the whole." So with fertilizers the law of direct proportion has limits; whereas a given amount of a fertilizer is beneficial and profitable, an excess may be, and often is, disastrous. As with a hard worked horse, a peck of oats may be a judicious feed, double that amount would be damaging. Therefore the importance of suitable rations, considering both the capacity of the soil and the plant in question.

The good effect of a manure may and should be, two-fold: 1. Its mechanical effect upon the texture of the soil. 2. Its inherent value in plant-food. This last point is one which appears in all the analyses made of manures and fertilizers, while the former is, I regret to say, too often overlooked, yet I believe it to be a matter of much importance.

Again, the question of digestibility of fertilizers, if I may borrow a physiological term, should never be overlooked. Chemical analysis would probably show as much or more starch or gluten in a pound of flour as in a pound of bread. Yet the human stomach would respond more readily to the pound of bread, simply because it is more digestible. For the same reason an equal amount of plant food in well compacted stable manure, I believe more readily available than in Carolina Rock phosphate, potash salts, etc.

It may have been supposed by some that I may be writing as a special champion of the fertilizer trade, and that, therefore, I ignore the manure heap as an auxiliary to successful cropping. By no means; would that we could increase the manure pile fifty fold. I believe in saving all animal and human excrement and urine, "so that nothing be lost." More than this, those who can easily do so should avail themselves of city stable manures to the utmost, as a most important means of increasing their crops, but after all this, most growers will feel the need of something more to reach the maximum of profitable production. So the question of fertilizers comes back to us with force and power as one that must be studied in all its aspects.

Health and vigor, yield and quality. The first three of these terms naturally go together. The last may, or possibly may not, go with them. It is safe, however, to say that to the commercial grower if he secures the first three he has the palm of success. But we want all four, and so far as we may we should take such steps as will tend to secure all. And we may justly conclude that all four of these requisites lie nearly in the same line. A stunted tree, or a sickly, feeble looking plant, is not one from which we should expect a high quality of fruit, but the reverse.

So far as healthful vigor goes, it goes in the right direction to secure yield, size, beauty, and we may say quality. A farmer once applied to the dealer to buy his potatoes, which were under size, hence he could not get full price. The farmer said, "I ought to have full price for I only had fifty bushels per acre." Then said the dealer, "I don't want them at any price; if you had a crop of two hundred bushels per acre, I would much rather take them." Peaches, sixty-four to the basket, are worth in cash four times what those are which require two hundred for a basket; I mean, of course, in a commercial sense.

I believe no man, no chemist, has yet sufficient data to say you must use just so much nitrogen, so much potash and so much phosphoric acid to secure just so much starch, sugar, and so much good flavor in your fruits. It may be said that an excess of chlorine in muriate of potash injures the quality of tobacco leaf and in-

terferes with the full normal production of sugar in our fruits. It may be; I do not deny, neither can it be absolutely affirmed. Still there are some reasons for thinking so.

I believe that the wild grape in our forests, and the same under garden culture, have shown a difference in sugar somewhat remarkable. This, however, may be considerably due to the increased heat in the soil and to culture, drainage and the better aeration of the soil.

Taking theory for what it is worth, and practical experience for the lessons it teaches, and we may safely arrive at a few conclusions which will be sound and of value:

1. Commercial fertilizers should always be used to supplement and never to supplant our home manures.

2. They should be used only in such rations as are safe and healthful, never passing the maximum of a truly economic application.

Perfection in any production depends upon the perfection of its integral parts. So if we desire perfection in fruits, we must supply in the best and most available form the elements needed in the desired article.

In this respect the previous management of the area should be known. Also its probable deficiency in any important requisite. I believe in using all those elements that the plant and fruit require to attain perfection and which the soil probably lacks. Again, it is better to supply a little more than the estimated need of the plant than to fall short. But we should endeavor to prevent parasites, both insect and fungus, and promote the health of the plant as truly as of an animal. A liberal application of manures to any soil or crop should be an added reason for the best possible culture to accompany it, believing as we do that heavy manuring cannot compensate for neglect in culture.

Finally, I believe in such manuring of the soil as shall leave it better as well as secure an immediate benefit, year by year. The idea of betterment should always accompany our plans. Thus by a wise rotation of crops and by an occasional plowing in of some green crop, the natural resources of the soil will increase, be readily available and combine to secure health, vigor, yield, quality and productiveness, and so of course pecuniary success—the great idea that underlies all our plans, present and prospective.

CHARLES A. GREEN, New York: Why do you give the caution in regard to the use of commercial fertilizers?

P. M AUGUR: I believe that in the application of nitrate of soda, and perhaps with some potash salts, there is a limit which it is not best to pass.

CHARLES A. GREEN: In my opinion there is no such thing as gluttony in plants; a plant will not take up more than it wants.

JAMES PAUL, Massachusetts: We all know, however, that an excess of certain manure, while it may not check the growth of the plant, will lessen the production of seed, and diminish the size of roots or tubers.

President BERCKMANS, Georgia: I think a plant can absorb too much plant food for the greatest production of fruit, but so far as a healthy growth is concerned, I do not think that it can. Whenever a vine, for example, has grown sufficiently to exhaust its superabundance of food it becomes fruitful.

A. S. FULLER, New Jersey: I certainly think there can be too much manure used. On clay, for example, I could safely use three times as much bone dust as on my sand.

T. C. THURLOW, Massachusetts: I think as a general thing we nurserymen are more deficient in knowing how, and how much manure to apply, than in anything else. Desiring to fertilize five acres of worn out land for grapes, I bought a ton of bone black, half a ton of muriate of potassium, and three hundred pounds of

nitrate of potassium. The cost of these amounted to ten dollars per acre. I mixed the fertilizers, applied to the land, harrowed in, and planted in potatoes, obtaining a good crop. In addition to the above a handful of wood ashes was applied to each hill. The potatoes left the land in good condition for the grapes.

CHARLES A. GREEN, New York: In Western New York we have not yet learned the value of commercial fertilizers. Our great nurserymen still use chiefly farm yard manure, for which they send great distances and pay three to four dollars a load.

JAMES PAUL, Massachusetts: I have had good success with all the commercial phosphates. We use four to five hundred pounds of super-phosphate per acre for potatoes, with or without farm-yard manure. One of my neighbors used four times the above quantity, and as a result obtained a very poor crop.

H. M. ENGLE, Pennsylvania: It is important to know what the soil lacks, as well as what the fertilizer contains. There is a difference also in the requirements of the different crops.

P. M. AUGUR, Connecticut: Some twenty years ago I had an orchard winter-killed as a result of a too free application of stable manure. I now use no stable manure, and cease cultivation by mid-summer. I once lost a patch of Cuthbert raspberries by late cultivation. After an orchard comes into bearing I do believe, however, that we can afford to use nitrogenous commercial fertilizers.

H. M. ENGLE, Pennsylvania: I think it best, as a rule, to cultivate raspberries later than other fruits. I have noticed that those canes which are produced late in the season bear the best the following year.

A. S. FULLER, New Jersey: I am satisfied that a late growth of raspberries is to be encouraged. The trouble all through the South is, that in summer the leaves burn so that the canes do not mature. In the mountains of New Mexico I have seen snow upon the bushes when they were full of leaves and fruit, and yet there was a good crop the following year. This ability of late growths to endure cold is especially true of red raspberries, but also to some extent of black raspberries and blackberries.

P. M. AUGUR: I might say in regard to heading in to prepare trees for winter, that we have abandoned it, as we believe that trees so treated are less hardy and bear less fruit.

CHAS. A. GREEN, New York: I would like to ask the question now, what is the best strawberry?

A. S. FULLER, New Jersey: Charles Downing is the best for market.

CHAS. A. GREEN: At Barnesville, Ohio, Sharpless is the favorite. The Wilson is of no value with us, on account of leaf-blight and having small berries.

T. C. THURLOW, Massachusetts: The Wilson for the first fifteen years was our favorite, and still a large part of our growers raise it. Sharpless, Manchester and Crescent are grown considerably.

T. S. HUBBARD, New York: We sell three times as many Wilson plants as any other. The variety is improved by an occasional change of locality.

H. M. ENGLE, Pennsylvania: Sharpless is the favorite with us. It has the best foliage. The foliage of the Downing turned brown so much that it had to be abandoned.

A. J. CAYWOOD, New York: The Wilson gives a good crop on only the first one or two pickings with us; after that the berries are small. It is not prized on the Hudson.

J. VAN LINDLEY, North Carolina: In Middle North Carolina the Sharpless is the most grown. In the Eastern part of the State several new sorts are being raised, among which is the Westbrook, which is paying well. Hoffman is also largely grown.

J. R. Hart, Nova Scotia: The Wilson is grown for its name, the Sharpless because it is large, but when people begin to know what they want they ask for Charles Downing.

D. W. Adams, Florida: In a considerable portion of Florida the Wilson is wearing honors that belong to some other variety. The Nona is one of these. I have yet to find in our State where the true Wilson has been a success.

P. M. Augur, Connecticut: The Wilson has been very generally abandoned with us. I believe its value can be kept up, however, by proper cultivation, and by preventing its bearing the first year.

J. R. Hart, Nova Scotia: Triumph De Gand gives me best satisfaction.

Chas. A. Green, New York: I agree with Mr. Fuller in regard to Charles Downing. It is my favorite for quality.

FRIDAY MORNING SESSION.

Report of the Committee on Fruits Exhibited.

To the President and Members of the American Pomological Society:

Your committee on fruits exhibited report the following awards:

WILDER MEDALS—SILVER.

E. F. Babcock, Russelville, Ark., for 58 named varieties apples, 68 varieties seedling apples and 15 seedling peaches, collected in the State of Arkansas, most of which are handsome in appearance and well grown.

Ellwanger & Barry, Rochester, N. Y., for 130 varieties pears.

T. S. Hubbard Co., Fredonia, N. Y., for 165 varieties grapes.

E. Williams, Montclair, N. J., for 50 plates of grapes of noteworthy excellence.

A. J. Caywood, Marlborough, N. Y., for Black Delaware, Ulster, White Concord and Poughkeepsie grapes, cross-mated by the exhibitor.

BRONZE MEDALS.

The Worcester Grange, for 77 varieties of apples.

Charles H. Hovey, Boston, for 118 varieties of pears.

Dudley W. Adams, Tangerine, Fla., for 2 varieties of Japanese Persimmons, and 2 varieties of lemons, notably well grown.

Lincoln Grange, for 21 varieties apples; 11 varieties of pears; 5 varieties peaches; 5 plates of Eaton grapes; 5 plates Hayes grapes; 1 plate Barberry.

HONORABLE MENTION.

Warren Femmo, for 42 varieties of pears.

Edward B. Wilder, for 45 varieties pears.

Smith & Kerman, St. Catharines, Ont., for 17 varieties of peaches, instructive as grown in the extreme northern limit of peach culture.

J. M. Hawks, Hawks Park, Fla., for 2 varieties of lemons, and 2 varieties of Japanese Persimmons.

W. W. Thompson, Smithville, Ga., for 3 varieties of lemons, and 1 variety of lime, 1 plate of Keiffer pear.

John B. Moore & Son, Concord, Mass., for exhibit of Eaton and Hayes grapes.

C. C. Shaw, Milford, N. H., for 36 varieties of apples.

P. P. Brooks, for 15 varieties of apples grown by Christopher Grastorf, Wellsville, N. Y., under A. N. Cole's system of subirrigation.

OTHER EXHIBITS.

Chas. S. Smith, Lincoln, Mass., 13 varieties of peaches.

David L. Fiske, Grafton, 9 varieties of peaches.

A. L. Hatch, Ithaca, Wis., 2 plates of McMahon's white apple.

Wm. A. Springer, Fremont, Wis., 2 plates of Wolf River apples.

Samuel Hartwell, Lincoln, Mass., 4 varieties of peaches.

R. Jack, Chateaugay Basin, P. Q., Canada, 1 plate Alexander apple, 1 plate Fameuse.

P. M. Augur, Middlefield, Conn., 1 plate Late Crawford peaches.

Mrs. Thos. Christian, Dorchester, Mass., box of raspberries, from this season's canes.

C. A. Green, Rochester, N. Y., 1 potted plant of Jessie strawberry in bearing, also photographs of a field of plants of the same variety, and a photograph of the Wilder pear.

W. C. Strong, Brighton, Mass., 6 plates of Niagara grapes grown by the Niagara Company, Lockport, N. Y.

G. W. Campbell, Delaware, O., 4 plates of Woodruff Red grapes.

Jenkins, McGuire & Co., Baltimore, Md., "The Ripe Fruit Carrier" shipping crate.

SPECIAL PRIZES OFFERED BY THE MASSACHUSETTS HORTICULTURAL SOCIETY FOR GENERAL DISPLAY OF FRUITS OF ALL KINDS.

Lincoln Grange	$25

FOR COLLECTION OF APPLES

E. F. Babcock, Russelville, Ark	$25
Worcester Grange	15
C. C. Shaw	10

COLLECTION OF PEARS.

Ellwanger & Barry	$25
C. H. Hovey	15
Warren Fenno	10

COLLECTION OF PEACHES.

C. S. Smith	$25
Smith & Kerman	15
David L. Fisk	10

COLLECTION OF NATIVE GRAPES.

T. S. Hubbard Co.	$25
E. Williams	15

F. M. Hexamer,
O. B. Hadwen,
P. M. Augur,
T. T. Lyon,
C. L. Watrous,
Robt. Manning,
Committee.

The Committee on Native Fruits made the following report:

Report on New Fruits.

To the President American Pomological Society:

The committee on new native fruits respectfully report as follows:

The chairman, upon invitation, during the season of 1886, visited the grounds of C. Engle, of Paw Paw, Michigan, who has, for many years, been engaged in the origination of seedling peaches. He has, more recently, been engaged in cross fertilization, with the purpose of improving the hardiness of the fruit buds of early and Late Crawford, using, in several of these crosses, the pollen of Hale's Early upon Late Crawford. A seedling of this cross is now fruiting, said to be in season about August 18th. Specimens of this were subsequently shown at the Michigan State Fair and received a premium, and a recommendation as worthy of trial. It is described as follows:

The tree is hardy; fruit very large, roundish, slightly elongated, mottled and obscurely striped with bright red; flesh creamy or greenish white; texture melting, fibrous, juicy, vinous, sprightly, rich; very good to best, uses, market and des-

sert; freestone. A very large and excellent early peach, adapted to fill the hiatus between Hale's Early and Early Crawford. At the request of the originator the committee named it Pearl.

At the same fair a seedling grape, originated by C. P. Chidester, of Olivet, Michigan, was recommended as worthy of trial. It is described as follows: A cross of Concord upon Delaware. The bunch and berry resemble Concord, the color being that of Delaware. The quality is excellent. The fruit ripens with Delaware. The vine is vigorous and seems hardy. The committee thought it very valuable, and, with the approval of the originator, it was named Lyon, in honor of the president of the Michigan State Horticultural Society.

Mr. Robert Manning, of Massachusetts, reports: "It is not, in my opinion, worth while to mention a parcel of seedling fruits, which will probably never be heard of again. The only ones that appear to me to be worthy of mention are the Belmont strawberry and the Eaton grape. The Belmont is, I believe, a seedling from the Sharpless, and resembles it in size and quality, but is of better shape. The flesh is firm; it keeps well and is thought desirable, both as a market and family variety. It is rather late. The plants are strong growers and very productive."

"The Eaton is a black grape, which has attracted much attention. In size of bunch and individual berries, and in generally attractive appearance, it excels any other native grape shown at our (Mass. Hort. Soc.'s) exhibitions. Its quality is good—about on a par with that of Concord, if I recollect rightly."

F. M. Hexamer, of New York, reports the Gold strawberry as a promising variety, embracing most of the good qualities of the Jewel, with a better flavor.

Dr. Samuel Hape, Hapeville, Ga., exhibits a supposed natural seedling of Vitis rotundifolia—on the branch, which he proposes to name Eden—claimed to mature earlier than any other of its class.

Levi Bell, Orangeburg, N. Y.: A new fall sweet apple; fair size, dark red with many dots; a fair sweet apple of good quality. It is said to be a great bearer. Specimens slightly affected with bitter rot.

Eli Minch, Shiloh, N. J.: A reputed new seedling; a yellow apple of good size, rather tart; apparently a tolerable culinary variety.

J. D. Cole, Deerfield, N. J.: Grange apple; a winter apple of the size, form and color of Rhode Island Greening, apparently a good keeper; mild in flavor, but too unripe to fully show its character.

C. R. H. Star, Port Williams, N. S.: Pear—A supposed seedling, but known for fifty years; size medium; obovate, clear yellow with a bright red cheek; stem an inch long; flesh fine grained, tender, melting, juicy; decays soon at the core; flavor vinous.

From the same: Plum—Size somewhat above medium; nearly round; dark purple with a bluish white bloom; clingstone; flesh greenish yellow; moderately juicy; quality medium.

Thos. A. Dawson, Worcester, Mass.: Apple—Below medium in size; form, oblate, dark red with many yellowish dots; a beautiful fruit; sprightly, subacid; probably a midwinter fruit.

E. F. Babcock, Russelville, Ark., shows 68 varieties of seedling apples selected by him in that State. After carefully looking over them and testing a few of those deemed most promising, the committee felt compelled to limit their report to the collection as a whole. The committee regard the exhibit as a very attractive one, and creditable to both the exhibitor and the State.

J. Van Lindley, Pomona, N. C., two seedling pears originated eight years since. Lucy Duke, large golden russet, pyriform; yet too immature to judge of its quality. Beaufort, size medium, in

form similar to Winter Nelis; said to keep into Winter; yet immature.

Smith & Kerman, St. Catharines, Ont.: Apple—Said to be a seedling of Fameuse, a Winter apple yet immature.

Allen Moyer, St. Catharines, Ont.: Similar in bunch, berry and quality to Delaware; said to be earlier than that variety and less sprightly in flavor.

Smith & Kerman: Peach—Similar in appearance and season to Smock free.

ILLINOIS CITY, Iowa.

No. 1—Marie Louise, best of the collection.

No. 3———

No. 6—Marguerite.

No. 8—Illinois City.

No. 9—Emma.

No. 10—Bertha.

No. 19—Alphonse.

No. 22—Warder.

The committee could only commend these, or any of them, in case they shall prove to possess valuable qualities aside from those manifest in the specimens shown.

J. T. Macomber, Grand Isle, Vt., exhibits an alleged hybrid between Strigosus and Occidentalis, which gives less evidence of value than Shaffer and several other similar varieties.

Wm. A. Springer, Fremont, Waupacca Co., Wis: Apples—Blaine, a fine looking fruit, but of indifferent quality.

Rightman—A sprightly winter apple, yet immature.

Alden—A fine looking acid fruit.

Martha—A bright red late autumn fruit, rather acid.

Waite—A September apple of indifferent quality.

Waupacca—A good looking oblate apple, of good size, but below medium in quality.

Manning—A yellowish apple of more than medium size and medium quality.

Crocker—Similar in appearance to Pewaukee, very mild in flavor.

Geo. W. Campbell, Delaware, Ohio: Grapes—Cross between Worden and Walter; bunch and berry small, compact, black with blue bloom; sweet with tender pulp.

Improved Delaware—Manifests little if any improvement so far as the fruit is concerned.

Bettina—Hybrid between Hartford and Muscat Hamburgh; in appearance and quality, intermediate between the two.

Peerless—Hybrid between Hartford and Muscat Hamburgh; greenish; bunch long, not shouldered; apparently not fully ripe.

Seedling of Worden, fertilized by Delaware and Purity pollen mixed; green; quality—apparently not fully ripe.

Worden and Delaware Seedling; sweet, but very foxy.

Seedling of Niagara; extra early; yellowish. Not apparently valuable.

With a Concord Seedling; a medium sized greenish grape of indifferent quality.

A. S. Fuller, Ridgewood, N. J.: Antoinette grape, one of the Miner Seedlings; greenish; bunch and berry above medium; vinous; slightly foxy.

Luther Eames, Framingham, Mass.: Cross between Concord and Delaware; bunch and berry large; double shouldered; light amber; pulp tender, with a slight Muscat flavor; the history should be supplied.

J. F. LeClare, Rochester, N. Y.: Diamond grape; Seedling by Jacob Moore; bunch and berry medium (first fruiting on two year vines); color, light green; quality good, though not fully ripe.

T. E. Burke: Chance Seedling grape, at Ottawa, Ontario; berry medium; bunch very large and compact; long double shouldered; pale green; whitish bloom; not fully ripe; flavor vinous.

Jas. M. Paul, North Adams, Mass.: Seedling grape, said to be very early. Bunch and berry below medium; pale green; bunch loose; pulp very tender; quality good.

T. T. LYON.
F. M. HENAMER.

On motion of E. T. Field, of New Jersey, the Executive Committee was authorized to fill any vacancies which might occur in the list of Vice Presidents.

Place of Next Meeting.

Dr. H. H. Carey, of Georgia, presented an invitation for the Society to hold its next meeting in the State of Florida, and suggested for the date February, 1879.

Dr. Samuel Hape, of Georgia, heartily seconded the invitation, and called attention to the liberality of the railroads of the South toward the pomological interests. In Georgia, delegates to such meetings are carried free both ways.

D. W. Adams, of Florida, promised a warm reception by the people of that State, and that everything possible would be done for the success of the meeting.

On motion of Chas. A. Green, of New York, the invitation to hold the next meeting of the Society in Florida, was unanimously accepted, the date and location to be determined by the Executive committee.

Discussion of New Fruits.

APPLES.

Yellow Transparent.—T. H. Hoskins, Vt.: At any place on Lake Memphremagog, in Northern Vermont, the Winters are less severe in some respects than where this variety has been tried in Iowa, and the summers are not as dry, but with me it has given good satisfaction and been perfectly hardy. I started in 1869 or '70 with scions from the Department of Agriculture.

T. T. Lyon, Mich.: In a recent Western trip, I found several different varieties grown under this name.

T. H. Hoskins: My only authority is the name under which I got it. It ripens through August, is very handsome, free from spots or cracks, not badly attacked by codling moth, being nearly as free from the moth as Oldenburg. With good culture, which it requires, it is fully medium in size. It is a good shipper. If picked just as it begins to color it will keep three weeks. It is hardly as good in quality as Early Harvest, but nobody complains of it. There are several closely related varieties, called the Yellow Transparent family, which includes the Red Duck, Sweet Pear, Charlottenthaler, White Transparent and Grand Sultan. The Yellow Transparent is much the hardiest of them all. Charlottenthaler is generally considered the largest, but I think there is little difference in this respect. The White Transparent is the smallest and best in quality. They are all dwarf, early bearers, not very long lived, and will bear planting as near together as 15 feet. Mine are planted 12x20. All seem to be subject to bark blight like the crabs, but they are ironclad as to the effect of winter and summer on the trunk.

J. T. Lovett, N. J.: It bears so heavily that it is rather small, but it is otherwise very desirable.

J. M. Smith: It is promising in Wisconsin.

Eli Minch, N. J.: In Southern New Jersey it does well and it is considered the best of its class.

Delaware Winter.—D. S. Myer, Del. (by letter): Introduced and named by Wm. P. Corsa, Milford, Del. My trees in nursery rows appear identical with Lawyer, and fruit of it which I have tested appears the same.

J. T. Lovett, N. J.: The trees differ in shape, growth and foliage from the Lawyer.

H. E. Van Deman, D. C.: The outward appearance of the fruit is much like the Lawyer but it is somewhat flatter and the flesh is very yellow. I think they are not the same.

Wealthy.—James Pael, Mass.: It is a late keeper. The best I ever saw were growing on the table lands of the Green Mountains.

T. H. Hoskins, Vt.: Have grown it for

fifteen years. Sold last year 1,000 bushels. My experience with it is favorable, except that it is not very sound in the trunk and forks of the limbs. It should therefore be top-worked.

T. T. LYON, Mich.: Within a few days I have had occassion to observe this tree in fruit in Minnesota, Iowa and Wisconsin, and I find this general complaint, that the tree is very liable to summer blight, and consequent injury in Winter.

A. L. HATCH, Wis.: Peter Gideon, of Minnesota, the originator of the Wealthy, says that it contains crab blood. This no doubt accounts for the liability of the trunk to crack in Winter, for its being affected by summer blight, and for its remarkable success when top grafted on the crab.

D. S. MARVIN, N. Y.: Very satisfactory in Northern New York. More hardy than Oldenburg. With us it is a Fall apple.

CHAS. GIBB, Quebec: The tree shows no weak points with us. The fruit is of good quality, but drops before ripe with comparatively slight winds.

McMahon's White.—A. L. HATCH, Wis.: Originated in Wisconsin, probably from seed of the Alexander. It has the best record for hardiness of any apple in general culture in the West. It has stood five severe Winters with me in Wisconsin. It might blight on rich soil, but on moderately rich soil. I know of no apple in the West its equal for money making. Its season is Fall, and some may undervalue it on that account, but I think we would have done better in the past had we grown chiefly the hardy Fall varieties.

Wallace Howard.—P. J. BERCKMANS, Ga.: One of the finest apples cultivated in the South.

ELI MISCH, N. J.: One of the most beautiful.

Wolf River.—T. H. HOSKINS, Vt.: Less hardy than its parent, Alexander, but otherwise like it.

A. L. HATCH, Wis.: Originated in Eastern Wisconsin, where it is perfectly hardy, but it is not hardy in the Western part of the State.

C. L. WATROUS, Ia.: Not hardy in Central Iowa.

T. T. LYON, Mich.: Almost if not quite identical with the Alexander. It is questionable whether it is best to introduce two varieties so near alike into the catalogue.

C. L. WATROUS, Ia.: The trees of the two varieties have hardly any points of identity. The Wolf River is a very thrifty, and the Alexander, a slow grower.

Fanny.—CHAS. A. GREEN, N. Y.: Mr. Charles Downing sent me scions of it, and recommended it as superior to Red Astrachan.

H. M. ENGLE, Pa.: It is later than Red Astrachan. It is red and very showy. It originated in Pennsylvania, and was introduced by Dr. Eastman of that State.

Barnes Stripe.—CHARLES GIBB, Quebec: It is handsome and of good quality. It was imported from Manchester, England, and has been grown under wrong names, among others that of Winter St. Lawrence, given by the Montreal Horticultural Society.

Scott's Winter.—T. H. HOSKINS, Vt.: A long keeper, and hardy in Northern Vermont.

CHAS. GIBB, Quebec: Hardy, a good bearer, of good size and color, and as successful a winter apple as we have.

T. H. HOSKINS, Vt.: Keeps until Yellow Transparent ripens, but is not of the highest quality for dessert.

Shaw.—C. C. SHAW, N. H.: A chance seedling which came up in a rocky pasture at Milford, New Hampshire. It is light red, conical, mild subacid, and ripens in September with the Gravenstein. The original tree is low and resembles the Baldwin. When grafted it grows rampant and bears better. It was named by the New England Horticultural Society, Shaw's Favorite.

Salome.—T. T. LYON, Mich.: I saw it in

February at the New Orleans Exposition. It was of fair quality, and I should think it a promising market sort if the tree is productive and hardy.

SAMUEL HAPE, Ga.: I should call it insipid.

Mann.—T. T. LYON, Mich.: We have too many better.

H. E. VANDEMAN, D. C.: It looks as bad as it tastes.

T. H. HOSKINS, Vt.: It is not ironclad.

Northwestern Greening.—H. E. VANDEMAN, D. C.: Resembles Lowell, but not as good in quality. I think it would sell. It is said to be hardy.

T. T. LYON, Mich.: It is not hardy in the Northwest.

C. L. WATROUS, Ia.: Not hardy.

Jacob Sweet.—T. C. THURLOW, Mass.: Promises to be our best late keeping Winter apple.

J. T. LOVETT, N. J.: It is handsome, of fine quality, fully as large as Early Bough, and a splendid grower.

PEARS.

Comet.—T. T. LYON, Mich.: As shown two years ago at Rochester it was very beautiful, of good size, but poor quality.

Keiffer.—H. M. ENGLE, Pa.: Good for anything except to eat

A. S. FULLER, N. J.: Then I must have the wrong variety.

P. J. BERCKMANS, Ga.: It is a great deal better in quality South than North. It is very productive and bears young. It is a most valuable fruit for cooking and market, and will answer for dessert. I should be very sorry to see it condemned for the Southern States.

J. VANLINDLEY, N. C.: It is one of our most valuable fruits. Ripens in October.

J. T. LOVETT, N. J.: It does best top grafted. In New Jersey, it has been used to work other varieties on, but it is not a success for that purpose, as other varieties do not unite readily with it.

P. M. AUGUR, Conn.: Most of the people in my State condemn it. It is a great bearer, and if properly thinned it is of much better quality, and to some tastes quite acceptable. Its taste is somewhat peculiar.

Le Conte.—P. J. BERCKMANS, Ga.: Like the Keiffer, it suits some sections better than others. It is not usually managed properly. If allowed to mature gradually off the tree, it is a real dessert quality. It is remarkably vigorous, and in Southwestern Georgia and Florida there are trees which produce wonderful crops. Your people in Boston have paid as high as $16 a case for them. It was first thrown out, then accepted for Massachusetts.

MR. COE, Conn.: In Central Connecticut it proves as well as in Georgia. It is larger and of better quality than Keiffer, but rots at the core.

H. H. CAREY, Ga.: Its growth in Southwestern Georgia is remarkable, often amounting to twelve feet a year. I have seen trees sixty feet in height. They are usually cut back.

G. B. BRACKETT, Ia.: I have seen it grow twelve feet from a cutting the first season.

Bessemianka.—CHAS. GIBB, Quebec: This is the best of our Russia pears. Its foliage is perfect, and its hardiness for four years in orchard with me has been all that I could desire. It is of medium size, of the Bergamont form, but not buttery.

T. H. HOSKINS, Vt.: Appears as hardy as the Wealthy apple. Stands when all the well known American and European varieties are killed.

A. L. HATCH, Wis.: The Russian pears fail to stand the Winter in nursery rows with us.

G. B. BRACKETT, Ia.: Of thirty varieties I have but three left, and Bessemianka is the hardiest. Sapieganka is nearly as hardy.

Sapieganka.—C. L. WATROUS, Ia.: This badly winter-kills with me at DesMoines, where Bessemianka is hardy.

CHAS. GIBB, Quebec: It is the chief

pear of Poland and Western Russia, somewhat better in quality, but less hardy than Bessemianka. Some of the other Russian pears are hardy, others not. I do not know whether we have in this country the Bergamont pear of the Volga or not.

Hoosac.—JAMES PAUL, Mass.: Originated by Mr. Foot near me at North Adams. Have seen it growing at his place and think well of it.

J. T. LOVETT, N. J.: Has fine flesh.

Wilder.—CHAS. A. GREEN, N. Y.: One of the best new early pears. Superior to Gifard, red cheeked, rather small, not inclined to rot at the core. The tree is vigorous. It originated in Ohio.

President Durand.—Mr. BISSEL, Va.: It is one of the few late pears which is liked for the Richmond market.

Madame VonSieboldt.—P. J. BERCKMANS: No better in quality than the old Chinese Sand pear. Not very desirable, except for cooking.

J. T. LOVETT, N. J.: It is larger than the Sand pear.

Micado.—P. J. BERCKMANS, Ga.: A good canning pear, and one of the finest growers.

J. T. LOVETT, N. J.: Pyriform, and larger than Madame VonSieboldt.

W. C. BARRY, N. Y.: The names were given by a European traveller, who brought them to this country.

Grand Isle.—T. H. HOSKINS, Vt.: Very productive, medium size, very fine, free from disease, and very profitable in the Champlain valley.

CHERRIES.

Windsor.—W. C. BARRY, N. Y.: Good, solid and worthy of cultivation.

Dye House.—W. C. BARRY: A nice little early sort.

T. T. LYON, Mich.: Poor.

T. H. HOSKINS, Vt.: Fair quality, but small.

Montmorency.—P. J. BERCKMANS, Ga.: One of the few adapted to Middle Georgia and South Carolina.

Wragg.—C. L. WATROUS, Ia.: Found by Mr. Wragg of my State in an orchard growing near another tree—supposed to be a sprout. Hardly distinguishable from the Morello. It is generally supposed to be of Russian origin, because at one time some Russian trees from Ellwanger and Barry were planted at that place. Some, however, have thought it a seedling of Morello. It seems to be hardy.

RUSSIAN CHERRIES.

C. L. WATROUS, Ia.: Have found some of them hardy.

CHAS. GIBB, Quebec: There are a good many cherries of Poland and Eastern Germany which have not yet come to this country. These are of the Spanish type. In Russia, however, there are only dwarf Morellos. They are grown there in immense quantities. I have some of them on trial. I have had specimens three years running on trees three feet high, and they are not on Mahaleb stock. The greatest trouble with the cherries of that class is that they turn red some time before getting ripe, so that they are liable to be taken by birds.

Louis Phillippe.—Mr. TAYLOR, N. Y.: As good as any of the large red sour sorts on our grounds.

PLUMS.

Kelsey.—P. J. BERCKMANS, Ga.: I first introduced it from California. I do not believe that it will ever be worth anything north of New York, and probably not north of the lower part of New Jersey. With us, and in Florida, it is very valuable. It is of the best quality, largest size, very productive and vigorous. I consider it the most promising new variety of that class that we have received in the Southern States for many years. It comes at a season when our fruits are scarce. Ripens too late for the North.

J. T. LOVETT, N. J.: Winter-killed with me last Winter for the first time in four years.

H. E. VANDEMAN, D. C.: I do not believe that it will do much farther north than the fig. In Northern Tennessee trees killed to the ground.

Botan.—J. T. LOVETT, N. J.: Ripens early, is beautiful, of fine quality, wonderfully productive and hardy.

H. E. VANDEMAN, D. C.: I have received specimens from Santa Rosa, California, of the red and yellow Botan. The latter a pronounced Washington, the former Lombard.

Prunus Simoni.—C. L. WATROUS, Ia.: Not hardy.

W. C. BARRY, N. Y.: A strong and hardy grower with us, but of no value, being so badly stung by the curculio.

Marianna.—SAMUEL HAPE, Ga.: Earlier and smaller than Wild Goose. Grows readily from cuttings.

C. L. WATROUS, Ia.: To be hardy with us it must be top grafted. Does well on Miner.

Robinson.—P. J. BERCKMANS, Ga.: Comes between Wild Goose and Newman. The latter is the latest of the Chicasa group, smaller than Wild Goose, and not so good in quality.

Blackman.—H. E. VANDEMAN, D. C.: The plum sold under that name by nurserymen has never yet produced a single blossom. There is another, however, which does fruit.

H. M. ENGLE, Pa.: We received it with a glowing description of its fruit, but it has not yet borne with us.

Moore's Arctic.—T. H. HOSKINS, Vt.: The only hardy plum I have. Probably a seedling of Lombard. It is a little smaller and less red, but otherwise like that variety. With me it is proof against curculio.

J. R. HART, N. S.: Not curculio proof. Almost the only plum raised in New Brunswick. It is laid down in Winter.

RUSSIAN PLUMS.

CHAS. GIBB, Quebec: The importations from Moscow were from Southwestern Russia, and did not contain any of the plums we saw on the Volga, so that it now appears that there are none of the Volga plums in this country.

Marster.—J. R. HART, N. S.: Originated in South Carolina four years ago. A moderate grower, hardy, prolific, fair quality, purple, ripening in September. It is nearly free from black knot.

De Soto.—G. B. BRACKETT, Ia.: Best in quality of our native plums. At the head of the list for Iowa.

J. J. HARRISON, O.: One of the best bearers we have.

Victoria.—J. H. BOURN, R. I.: Third quality, but fine appearance.

A. S. FULLER, N. J.: It is more than fifty years old.

A. J. CAYWOOD, N. Y.: We are discouraged with plum growing on the Hudson, on account of the black knot.

ROBT. MANNING: The same is the case in Massachusetts.

PEACHES.

Keyport White.—J. H. BOURN, R. I.: A good late sort.

T. T. LYON: There are better sorts for Michigan.

A. S. FULLER, N. J.: An old sort reintroduced, and of much value in the South.

SAMUEL HAPE, Ga.: A good shipper and keeper.

Peen-to.—P. J. BERCKMANS, Ga.: A variety over fifty years old, of which the orange growers of Florida are just beginning to learn the value. It blooms too early and is therefore worthless north of the orange belt.

Bidwell's Early.—P. J. BERCKMANS: One of the long forms, originated from seed of Peen-to. It is claimed that it blossoms later, and hence is more reliable.

H. E. VANDEMAN, D. C.: I have positive information of a Peen-to tree producing long peaches. Bidwell, as well as the Peen to, is unreliable north of Florida.

Stevenson's Rareripe.—H. H. CAREY,

Ga.: Larger, when well grown, than Crawford, better in quality, and a good grower.

T. T. LYON, Mich.: Not worth having on the list.

CHAS. BLACK, N. J.: A fine late peach of fair size, largely grown in my State, ripening between Crawford's Late and Smock.

Albright.—J. VANLINDLEY, N. C.: Originated in my county. Like Heath Cling, but a month later.

H. M. ENGLE, Pa.: That which I have under that name is a white free stone of the Mixon type, about the size of the Mixon and coming about with Smock and Salway.

QUINCES

Champion.—T. T. LYON, Mich.: Of large size, a heavy and early bearer, but will not ripen in Michigan.

A. J. CAYWOOD, N. Y.: We cannot ripen it on the Hudson.

H. M. ENGLE, Pa.: Fills the place when other quinces are gone.

SAMUEL HAPE, Ga.: In our latitude its lateness makes it very profitable.

GRAPES.

Moore's Early.—A. L. HATCH, Wis.: Can it be gratted, and is it fruitful?

T. C. THURLOW, Mass.: Nearly as fruitful as Concord with me.

SAMUEL HAPE, Ga.: No earlier with me than Concord, but a little larger. It differs somewhat in different locations.

J. H. BOTERN, R. I.: Its only value is earliness.

T. T. LYON, Mich.: Used in Michigan as an early market grape, but not sufficiently productive.

W. C. STRONG, Mass.: With most growers it is less productive than Concord.

A. J. CAYWOOD, N. Y.: We can safely recommend it for our northern regions. It is large and coarse, but a sure bearer and produces a fair crop.

T. S. HUBBARD, N. Y.: In Western New York it sometimes bears a heavy crop.

Worden.—SAMUEL HAPE, Ga.: A splendid variety.

Mr. TAYLOR, N. Y.: It drops.

G. B. BRACKETT, Ia.: One of the best.

T. T. LYON, Mich.: Taking the place of Concord.

T. S. HUBBARD, N. Y.: Earlier than Concord, better in quality, a larger berry and better cluster.

Empire State.—SAMUEL HAPE, Ga.: Recently introduced near Atlanta, and doing well.

GEO. W. CAMPBELL, O.: It was planted in Central Ohio as soon as introduced, and has been one of freest from mildew. It is of fine quality, the best of any white grape that I have met. I doubt its being a pure native. Hartford and Clinton are claimed as its parents. It is less productive than Niagara, but fully as hardy and more healthy.

A. J. CAYWOOD, N. Y.: Originated in my neighborhood. I fear we shall be disappointed with it. With a full crop the clusters are small. The skin has an unpleasant taste.

T. C. THURLOW, Mass.: With us it mildews.

Coe.—SAMUEL HAPE, Ga.: Fine quality, as vigorous as Delaware, of the same season, with smaller bunch and larger berry.

Woodruff.—T. T. LYON, Mich.: A promising market grape, originating in Michigan.

GEORGE W. CAMPBELL, O.: Seems to be hardy and healthy. Has large Labrusca, mildew resisting foliage. The clusters, as I have seen them exhibited, are large, and the berries large. Perhaps it has a little too much of what has been called the "native aroma," which some, however, like.

CHAS. A. GREEN, N. Y.: Bunch small, quality poor, very pulpy and foxy, but productive and handsome.

G. B. BRACKETT, Ia.: Fruiting the first

time in our State it is all that we can desire, especially in leaf.

T. S. HUBBARD, N. Y.: There were, as I saw it at Ann Arbor, Michigan, where it originated, a few fine clusters on a vine, the others being loose and small.

It is a strong grower and appears healthy, hardy, and free from rot. With me it is fruiting this season and doing well, the clusters seeming better than at Ann Arbor

Jewell.—H. E. VANDEMAN, D. C.: Very early with medium sized berry, of good quality and small clusters.

GEO. W. CAMPBELL, O.: Much like Early Victor, clusters no larger, berries a little larger, quality better, and about one week earlier, ripening with Moore's Early.

Early Victor.—GEO. W. CAMPBELL, O.: Originated by Mr. Burr, of Leavenworth, Kansas. Hardy, of fair size, and productive. Ripens nearly with Hartford and Champion, but of better quality.

T. S. HUBBARD, N. Y.: I saw the Early Victor, and also the Jewell at Mr. Burr's place in July last. The Early Victor was doing better there than with us. The Jewell was not very promising, so far as I could see.

At this point the President announced that the laws of Massachusetts required the formal acceptance by a corporation of its charter, and that the Secretary of State be notified of the fact.

The charter was then read by the Secretary, and on motion was unanimously adopted by the Society.

On motion of W. C. Strong, the funds of the Society in the hands of its Treasurer were directed to be transferred to the treasury of the corporation.

STRAWBERRIES.

Jennie.—CHAS. A. GREEN, N. Y.: At Rochester it is doing very nicely, growing healthy and vigorous. It has borne some fruit all through the season.

Dorchester.—J. H. BOURN, R. I.: Of high quality, beautiful and firm.

Galceron.—SAMUEL HAPE, Ga.: Named for a Spaniard who originated it near Atlanta. The finest berry I have ever shipped.

Belmont.—J. H. BOURN, R. I.: A fine berry of first quality.

Dr. H. H. Carey, of Georgia, offered the following resolutions, which were unanimously adopted:

Resolved, That the thanks of the American Pomological Society are due, and are hereby tendered, to the City of Boston for the refined and elegant hospitalities extended to our Society during the session of the convention in their city.

Resolved, further, That the thanks of this Society are most heartily tendered to the Massachusetts Horticultural Society for its many courtesies, the use of its hall, excursion and banquet tendered; and to the Committee of Arrangements for its excellent forethought in arranging so completely for our convenience and comfort

FRIDAY AFTERNOON.

The Society, upon invitation of Mayor O'Brien, spent the afternoon in a pleasant excursion to Deer Island, Boston harbor. The members improved the opportunity in comparing personal notes and making new acquaintances.

On the return trip, the Society expressed its appreciation of the courtesy of the city officials by the following resolutions, presented by Dudley W. Adams, of Florida:

WHEREAS, The American Pomological Society has received from the City of Boston, the high compliment and great pleasure of this excursion. Therefore be it

Resolved, That we fully appreciate the spirit and social value of this friendly and courteous act.

Resolved, That we hereby tender His Honor, Mayor Hugh O'Brien, and his associates, our sincere thanks, with the assurance that we shall carry to our widely scattered homes pleasant memories of their hospitality.

FRIDAY EVENING.

The banquet at the Revere House, given to the visiting Pomologists by the Massachusetts Horticultural Society, made a pleasant finish to the sessions of the week. The tables were laden with

good things, and beautifully decorated with fruits and flowers.

Dr. H. P. Walcott, President of the Massachusetts Horticultural Society, in calling the company to order, reminded the members that more than two hundred and sixty years ago Blackstone, the first settler of Boston, planted an orchard on the southern slope of the hill upon which they were assembled. After calling attention to some of the progress made in Pomology since that time, he introduced the toast-master of the evening, Hon. Chas. L. Flint, of Boston.

In assuming his duties Mr. Flint asked the company to rise in memory of the late President, Marshall P. Wilder.

The first toast, "The American Pomological Society" was then presented, and the Hon. P. J. Berckmans, of Georgia, the newly elected President, was called upon to respond. Mr. Berckmans said:

When our respected and lamented friend (Mr. Wilder) last visited the South, in a response to the Mayor of Richmond he used these words: "While our exports are now mainly granite and ice, I assure you our hearts are as warm as ever." I wish to say that we have found it so since our stay among you. You have been more than generous to us. I wish also to express the appreciation of American Pomologists for the work of your Society. Without the Massachusetts Horticultural Society, the American Pomological Society would not have existed. Your members have been the leading spirits in American Pomology. Among your names, that of Mr. Hovey will remain connected with some of the most valuable fruits in cultivation, Hovey Seedling, which was the pioneer of successful strawberry growing at the South. The next toast, "The Commonwealth of Massachusetts," in the absence of Gov. Ames, was responded to by Hon. Geo. B. Loring. He had expected, he said, to respond for the New England Agricultural Society, of which he was proud to be a member.

The State had always encouraged agriculture in all its branches. It organized the first Board of Agriculture, and the second, if not the first, successful Horticultural Society. The system of land tenure which was the pride of the nation, is the one which had its origin in Massachusetts. He was glad to help welcome the fruit growers from all parts of the country to these scenes of early horticultural efforts, and the land where so many of our best varieties originated.

Hon. Charles L. Flint, in the unavoidable absence of Mayor O'Brien, responded for the "City of Boston." He regretted that the toast fell to him, as every one who responds to it is sure to be accused of bragging. On the 10th of October, 1639, the first Pomological exhibition in the United States was held in the city of Boston, the fruit being brought from Governor's Island in the harbor, "there being not one apple or pear tree planted in the whole country, but upon that Island." It was here, only five years after the landing of the pilgrims, that the first free school was established, which, together with the first church, still lives. It was here that the dogma that taxation and representation are inseparable, was enunciated by the fathers of this town, more than a hundred years before the declaration of independence.

The "Pennsylvania Horticultural Society, the Pioneer on the Continent," in the absence of Mr. Engle, who was chosen to respond, was omitted.

Mr. S. B. Parsons, in speaking for the New York Horticultural Society, referred to the interest taken in Horticulture by persons in other pursuits, and paid a tribute to the memory of Marshall P. Wilder.

Rev. Mr. Hart, of Nova Scotia, responded for the Dominion of Canada. He claimed to be a descendant of the Tories who fled from Boston about the time of the famous tea party, and he now came back to another tea party when the international feeling was more amicable. We

are as earnest, he said, in our efforts at fruit culture as are you. Our mothers gathered sorrel to make fruit pies, waiting till the apples grew. We have succeeded with some things: our Baldwin apples and Bartlett pears are even better than yours, and through the efforts of Mr. Saunders and our newly established experiment stations, we hope to make fruit growing still more successful.

"The Pomology of the South" was responded to by Dr. Samuel Hape, of Georgia. He referred to the time ten or twelve years ago when the Society met for the first time after the war, in Faneuil Hall, and to the warm reception then given to the delegates from the South. He had read Mr. Grady's famous speech in New York, and he felt like adding that in no time, and among no people, had a conquered people received such magnanimous treatment at the hands of the conquerors as the South had received at the hands of the North. He was glad that fruit growers recognized no sectional lines, and that the Society had honored the South by electing one of its most respected citizens as its President; and he said that two years hence the Southern delegates would endeavor to give the visiting fruit growers as warm a welcome among the orange groves of Florida as they had received here.

"The Pomology of the West" called out Mr. C. L. Watrous, of Iowa. He said that the people of the West were busy and prosperous, but that they were always glad to get back to the cupboard of their mother, and that if any had been gone so long that none of their friends remained, they still sent the message "give my love to the hills." Our fruits, like ourselves, he said, had their origin in the East, and we have much trouble in finding those fully adapted to our climate, but we shall succeed. No race whose sires date back to New England, will live in any country without having an abundance of fruit of some kind.

F. M. Hexamer, of New York, spoke for the Agricultural and Horticultural Press. He referred to Boston as the cradle of horticultural journalism in America, and to the need for the spread of horticultural information among the people. He believed that the principles of agriculture and horticulture should be taught in the public schools. The power of observing well, he said, is the most important element of an education, and nothing is so well adapted to develop this power as the pursuits of agriculture and horticulture.

Dudley W. Adams responded to the toast, "The Pomology of Florida." He, too, was a son of Massachusetts, and with others who had left their New England homes would be on hand to welcome them at their next meeting in "the land where the mango grows."

The response to the concluding toast, "The New England Agricultural Society," was made by its Secretary, Hon. Daniel Needham, who expressed his pleasure in being permitted to assist in welcoming so many of the fruit growers from other parts of the country. That Society had co-operated, he said, in the twenty-four years of its existence, with all efforts to advance the interests of agriculture and horticulture, and had always received the hearty sympathy and support of the Massachusetts Horticultural Society.

SOME PESTS OF THE POMOLOGIST.

BY J. A. LINTNER, ALBANY, N. Y.

The large attendance at this convention, the several States of the Union represented, the distinguished men participating in it, the high order of the discussions and papers that have been presented, the exhibit of fruit that is made—all bear testimony to the widespread interest of the present day in fruit culture and the great advance that has been attained therein.

PROGRESS IN POMOLOGY.

It is not my province to do more than mention the progress made in fruit-culture within a few years past. This privilege belongs to those who have been active participants and agents in its stimulation and remarkable growth. We can not but recognize its results in the many fruits it has given us previously unknown in our markets—varieties far surpassing those which we formerly enjoyed, and an abundance such as we had never dreamed of, bringing them within reach of all.

EVILS ATTENDING PROGRESS IN POMOLOGY.

Yet this has not been attained without attendant evils. Here, as elsewhere, in all that pertains to the advancement of our race—at every step of progress, a penalty has been incurred and exacted. It is patent to all that the development of Pomology into a science and an important industry of our country, has only been accomplished through a great increase of plant diseases and a remarkable multiplication of insect pests. These two evils follow as a necessary consequence of the advance made: They are connected therewith as inseparably as cause and effect. And what part they are to play in the future in retarding, arresting or ruining fruit-culture, must depend upon the manner in which they are met by the enlightened fruit-grower.

NEED OF SCIENTIFIC STUDY.

You do well, gentlemen, in calling to your aid whatever science is able to do for you in the investigation of the serious evils to which I have referred. It is of the utmost importance that you should know each one of your enemies, whether it be a soil constituent, a vegetable, or an animal—its character or nature, whence it proceeds, how it acts, and above all, the most economical and efficient means for overcoming it. You particularly need the best skill of the chemist, of the botanist, the mycologist, and the entomologist. Their services are freely at your command, whether asked for of our Scientific schools, Agricultural Colleges, State Experiment Stations, the United States Department of Agriculture at Washington or of our State Entomologists.

DEMANDS OF SCIENCE ON THE POMOLOGIST.

But let me remind you that you too have an important part to perform in this needed observation, study and investigation of plant diseases and insect injuries. You are brought face to face with them, day after day, more intimately, more continuously, and I may add, more advantageously than is possible for the scientist to be. Your trained eyes are quick to detect the first indication of disease or injury; and you should be able to discern its nature, to the extent, at least, that you may promptly summon to your aid, if aid be needed, that particular scientific investigation which the occasion demands. And what a broad field of co-operation

with the specialist is open, if, when through the aid extended, you have been led in the proper direction, you not only faithfully follow the course marked out for your guidance, but also test the value of experiments that will naturally be suggested by the failure or partial success that meets your efforts.

The sciences that are lending you their cordial co-operation have a claim upon you, yes, have a right to demand this at your hands. Upon you is chargeable the curse that surely is hanging over, if not already fallen upon fruit-culture in our country—"in the sweat of thy face shalt thou eat" fruit! I do not overstate when I say that the great increase of plant diseases and insect ravages that you are experiencing is the direct result of the enormously increased production of fruit, and the large area in which fruit crops are massed.

IMMENSE FRUIT PRODUCTION—NO OVER PRODUCTION.

Compare the production of fruit today with what it was in the childhood of any here present, both in variety and quantity. To go back farther than many of you are able—in my childhood an orange was a rarity; a peach was seen at intervals of years. I only knew one variety of cherry; our apples did not exceed a score, and pears a half score. Now, freight trains of fruits of almost countless varieties are rolling over our country, carrying the delicious and healthful products to central marts, whence they may be distributed to every home in our land, and even find their way beyond the oceans that bound our continent. No wonder, it may be remarked in passing, that under such production, prices may, at times, become very low, and the cry is heard, "raising fruit does not pay!" A prominent member of one of our horticultural societies recently made this remark in a public address: "There is such an overproduction of these fruits [referring to a certain class] that they will no longer pay, unless some insect pests will come and relieve us of half the crop." What a ridiculous, pitiable, senseless statement to make! Markets that will yield remunerative prices are, and will continue, to be found to enterprising, energetic, sagacious business men. If not already existing, they may be built up, and the demand will follow. There can be no over-production, for the retarding houses, canneries and evaporators springing up in all our fruit regions will keep pace with production. The desire for, the need of, wholesome fruit will ever be in excess of its growth. As its price falls—to quote the words of a fruit dealer in Philadelphia, who last September received and sold in three days 665,000 pounds of grapes—"everybody wants it." Should an unusually favorable season give a yield beyond the possibility of gathering, transportation, or preservation, why not try the experiment of giving the freedom of your orchards to "the poor, whom ye have always with you," and see if it is not almost as good to give as to receive.

It does not appear to be known what the aggregate value of the fruit crop in the United States amounts to, but surely that must be a safe estimate that places it at between two hundred and three hundred millions of dollars annually.

LARGE AREAS DEVOTED TO FRUIT CROPS.

This enormous production which is but the natural outgrowth of the discovery of the peculiar adaptation of the soil and climate of many portions of our country to fruit culture, has compelled its cultivation in larger areas than anywhere else in the world. An apple orchard on the Hudson river, at Greenport, N. Y., covers 300 acres. At Orchard Hill, in Georgia, is a peach orchard of 790 acres, and 84,000 bearing trees. The vineyard of Leland Stanford, at Vina, California, has 4,000 acres in vines in a tract of six miles long by two wide.

How does this massing of crops tend to promote an increase in insect ravages? Let me illustrate it by what I have elsewhere written of our apple insects:

"Two hundred years ago not even the wild crab, the earliest representative of the apple, existed in this country, and consequently there were no apple insects. Later, when a few apple trees became the adjunct of the simple homes of the early settlers, those of our insects to which they offered more desirable food than that on which they had previously subsisted, were obliged to wing their way often for many miles in search of a tree upon which to deposit their eggs. If birds were then abundant, how few of the insects could safely accomplish such extended flights. But in the apple orchards of the present day—some of them spreading in an almost unbroken mass of foliage over hundreds of acres—our numerous apple insects may find the thrifty root, the vigorous trunk, the succulent twig, the tender bud, the juicy leaf, the fragrant blossom, and the crisp or mellow fruit spread out before them in broad array, as if it were a special offering to insect voracity, or a banquet purposely extending an irresistible invitation to the tent-caterpillar, the codling-moth, the canker worm, the striped-borer, the bark-beetle, the twig-borer, the leaf-aphis, the bark-louse, the root-louse, and every other of our two hundred species of apple insects. Here they may luxuriate as nowhere else. The required food is greatly in excess of insect need. Careful cultivation has made it the best of its kind; appetite is stimulated; development is hastened; broods are increased in number; individuals are multiplied beyond the conservation of parasitic destruction; facilities of distribution are afforded with hardly a proper exercise of locomotive organs, and when these almost useless members have become aborted, as in the wingless females of the bark-louse (*Mytilaspis pomicorticis*) and the canker-worms (*Anisopteryx vernata* and *A. pometaria*), the interlocking branches afford convenient passage from tree to tree."

INCREASE IN PLANT DISEASES.

The same causes, viz., high culture, enormous production, and massing in large areas, inevitably promote plant diseases. Let me, in passing, simply name a few of these, since they are so intimately connected with insect attack, being often its precursor or sequence—and then leave them to be discussed by those to whom their study properly belongs.

Of the more than two hundred species of fungi known to infest the grape vine, special attention has been called within the last few years, to the following, from the serious losses that they have occassioned: The Downy Mildew (*Peronospora viticola*); the Powdery Mildew (*Uncinula spiralis*); the Black Rot (*Physalospora Bidwellii*). Anthracnose (*Sphaceloma ampelinum*) is a comparatively new grape disease in this country, but one long known in Europe, which attacks the vine, the leaf and the berry.

Of other well-known and destructive diseases, are the Peach Yellows (no satisfactory cause or cure for which has yet been discovered); the Peach-leaf curl (*Exoascus deformans*); the Plum-rot (*Monilia fructigena*); the Black-knot (*Plowrightia morbosa*) of the plum and cherry; the Plum-leaf fungus (*Septoria cerasina*), affecting also the cherry, and the apricot and peach slightly, causing often one-half of the leaf to die and fall away in rounded holes, as in examples recently received by me from an orchard in Canada; the Apple rust (*Roestelia penicillata*); the Apple and Pear scab (*Fusicladium dendriticum* and *F. pyrinum*); the Pear-blight so extensively written of and but lately shown to be caused by the bacteria which has been named *Micrococcus amylororus*, also infesting the apple and several other fruits; the Tomato-rot in green fruit (probably *Cladosporium fulvum*); the Gooseberry blight; the Raspberry rust

(*Cæoma nitens*); and the Spot disease or leaf-blight of the strawberry (*Ramularia Tulasni*). The causes and cures of these and of many others associated with them, are deserving, from their great economic importance, of the study that is being given to them. Valuable results are expected from the establishment about a year ago of a Mycological section in the Department of Agriculture at Washington, specially charged with the study of the fungus diseases of plants, and it was very fitting that this section should have received the cordial endorsement of your Society so promptly given it.

New diseases are being discovered from time to time. A very remarkable one has lately been reported to the State Horticultural Society of California. The writer names it, "Paralysis of Apricot Trees." It had been observed by him in three different cases in three years, in apricot and apple trees that had been grafted on other stock. They were of exuberant growth, in healthy foliage and were bearing abundantly normally developed fruit. It is described as follows:

"In the morning the trees appeared to be in full health; shortly after 10 o'clock the leaves suddenly became weak and every leaf, without exception hung lifeless on the tree. In the afternoon the fruit and bark began to shrink, and in forty-eight hours all the leaves and young shoots were entirely withered and the fruit shrunken and nearly dried up. Two trees were tested with the knife, and it was found that the paralysis and death had taken place from the grafting-point upward."

INCREASE OF INSECT RAVAGES.

Passing now to insect pests—it is surely evident to every fruit grower that, with each successive year, the difficulty of growing choice and perfect fruit is becoming greater. He can no longer ignore the insect as an insignificant object in nature, almost unworthy of regard. The myriad hosts confront him on every side and demand his attention. They claim the choicest products of his labor—not a tithe of them, which might, perhaps, be granted, but the entirety. It is a struggle for mastery, in which he must conquer the insect, or the insect will conquer him.

The primary causes that have necessitated this warfare have been given you in general terms, but the consequences of these might not extend much beyond a multiplication of the individuals of a species. But beyond this, another serious element is forced upon us, viz., a continual increase in the number of species preying upon fruits.

FOOD-HABITS OF INSECTS.

You all know that our noxious insects are divisible into many groups, indicated by the food-plants upon which they subsist. Thus we have our grass insects, our grain insects, insects infesting our forest trees, those infesting our flowering plants, those attacking garden vegetables, a long list of household pests, those that live upon our domestic animals, etc., etc. Insects are more or less particular in their food. There are those that confine themselves to a certain species of plant and will starve rather than change to another. Very many will feed upon allied plants as associated by structure and character in a genus or a family; while others, polyphagous species, as they are termed, extend their range through different and often dissimilar orders of the vegetable world.

CHANGE OF FOOD-PLANTS.

Thus it is that the fruit grower not unfrequently has to contend with some insect depredator quite new to him and to his locality. He submits it, as he should, to some authority in entomology, and it is found to be a species previously known as subsisting on some other food-plant. Chance, it may be, has brought it to an apple tree, and it at once finds in its material, food more agreeable and attractive to it than that on which it had hitherto

fed. It becomes an apple tree insect, and displays under the stimulating effect of its changed diet, far more destructive habits than those that before pertained to it. To illustrate: A little bark-boring beetle (*Scolytus rugulosus*), which for several years has been known to us only as destroying cherry, peach and plum trees, has been discovered by me the present year as working in large numbers beneath the bark of apple trees and quickly killing them by running its galleries over and around the trunk until it is completely girdled.

INTRODUCTION FROM ABROAD.

Again, the new pest proves to be an introduced species, brought over from Europe through some commercial avenue, readily planting itself in its new home, and spreading from thence over the country as broadly as the area of its food-plant or suitable climatal conditions will permit. And almost without exception, a species thus introduced from abroad, unattended by its natural parasites and freed from other enemies that had learned to prey upon and control it, is at once transformed into a pest of such magnitude, that its harmfulness in the old world is in marked contrast with its ravages in the new.

SPREAD OF SCALE INSECTS.

In illustration of the evils often attendant upon a change of food-plants and extension of range, and also, the increased destructiveness of introduced species, we may refer to the struggle which the fruit growers of California are at the present time undergoing with insect pests, and notably, with scale insects, which have followed the recent extended culture of the citrus fruits, particularly the orange, in that State.

Attack by the members of this family, known as the *Coccidæ*, is always dreaded, as they multiply with amazing rapidity, and are protected during nearly all of their life by a shield-like covering, which is impervious to such applications as ordinarily suffice to destroy more exposed forms. They are not even amenable to the poison of arsenical preparations, which are our best insecticides wherever they may be safely employed, as they find their food in the juices of plants, extracted by means of a needle-like proboscis driven through the bark or epidermis of the leaf.

The scale insect, which is especially enlisting wide-spread attention in California, receiving the most careful study, and, from the difficulty of its control, exciting great alarm, is known as "the fluted scale," or the cottony-cushion scale, from the peculiar and conspicuous cotton-like mass attached to it and sheltering its eggs. Scientifically it is known as *Icerya Purchasi* Maskell. Australia, South Africa, New Zealand and California are its only localities, so far as known to us. Its original food plant is believed to have been an Acacia—thorny trees or shrubs belonging to the *Leguminosæ*, of which we have no native species north of Texas. On an Acacia imported from Australia it was in all probability introduced into California in 1868 or 1869. From this plant it spread to various orchard and ornamental trees, garden plants, weeds, etc. A few of these may be enumerated as showing the possible range of some of these pernicious scales: Orange, lemon, quince, pomegranate, apple, pear, peach, apricot, fig, strawberry, grape, hawthorn, walnut, oak, pine, cypress, laurel, locust, elm, willow, ivy, rose, verbena and box. According to a writer in New Zealand, "it attacks all sorts of plants." It is proving particularly destructive to the orange, entire plantations of which have been completely destroyed. Not yet overspreading the entire State, the most earnest efforts are being made to arrest its distribution. Laws have been enacted, under which fruit inspectors have been appointed, whose duty it is to enforce the laws, and even to search out the infested trees and compel their destruction.

The interest taken in this crusade

against insect pests in California, and the desire to conduct it in the most efficient manner, is shown in the following extract from an address recently made by the Secretary of the California Horticultural Society:

"Every effort is being made by Horticulturists to resist the spread of fruit-pests. Every method suggested by reliable scientists and fruitmen is being thoroughly tested. Usually not much urging is required to induce the owners of pest-ridden orchards to try the latest discoveries, as they are only too willing to attempt the eradication of their insect enemies. In this way many new applications are being discovered. If we can succeed in checking the ravages of the pests, this State is bound to become the orchard of the world."—(Pacific Rural Press, August 20, 1887, p. 145).

It is devoutly to be hoped that the "Australian bug," as it is sometimes called, together with the Red Scale (*Aspidiotus aurantii*) also introduced from Australia, and other of its associates, may not become distributed over the United States, to add to the already almost overwhelming number of our fruit insects.

There is little danger of the introduction this side of the Rocky Mountains of the larger number of the Californian scale-insects, through the fruit which is being brought eastward, for nearly all of them are fixed to the plant upon which they subsist during their entire life except a brief period following their hatching from the egg. The Icerya, or Fluted Scale, unfortunately possesses habits more favorable to its spread, for it remains free and travels about during the greater part of its existence. In its last stage—according to Prof. Riley, to whom we are indebted for the elaborate study of this insect as given in his last annual report[*]—and just before the production of its eggs, it shows a disposition to travel in search of some place of concealment, as beneath rough bark. Under this impulse, it might leave the tree and find a convenient hiding-place in some fruit package, and there be conveyed by rail to a distant locality. The common mode of distribution of scale-insects is through the sale of scions and nursery stock. I do not know if these are being brought from California eastward. If such a business has been inaugurated (of which there would seem to be no need), every effort should be made to suppress it, as it would not be possible to institute such a system of inspection for the detection and destruction of infested stock, as has been adopted by several of the countries of Europe to protect them from the introduction of the terrible Phylloxera pest.

I have dwelt at some length on these scale-insects, in consideration of their extreme virulence and the harm that will attend their spread. When they have been allowed to gain the footing that they now have in California, it is not possible to exterminate them. The most that can be accomplished is to reduce their numbers, and to exclude them from localities now free from their presence. I believe that the Icerya has not yet shown itself in the orange groves of Florida. Whenever it shall do so, unless it be met as promptly as we are accustomed to deal with a rabid animal, it is safe to predict that the orange culture of that State is doomed. Arizona is just giving promise of becoming a wonderful fruit region. As yet, it is almost free from fruit-pests. Peaches, it is claimed, can there be eaten from the tree from June to December. If so, with proper railroad facilities, we in our Eastern cities could enjoy the delicious fruit during one-half of the year. How desirable it is that such prospects should not be blighted by permitting an influx into Arizona of the scale and other

[*] Report of the Commissioner of Agriculture for 1886, pp. 465–492, pl. i–v. See also: The Icerya or Fluted Scale, Bulletin 15, U. S. Dept. Agricul., Division of Entomology, 1887, pp. 40.

pests which it is possible to exclude, for years, at least.

NUMBER OF INSECT PESTS.

I have referred to the large number of our fruit-pests, in species, of perhaps equal importance with the number of individuals, since each one of the species requires separate study that is particular life-history and habits may be learned, and thereby a knowledge obtained of the best method of dealing with it. If a noxious form, then the most efficient means for its destruction is to be sought; if beneficial, in the great service that it renders in preying upon injurious species, as do entire families like those of the Ichneumens, Lady-birds and others—in that case study must be made of how it may best be protected and its multiplication promoted.

Of the three hundred and twenty-five thousand species of insects known to science through name and description, as existing in the world, twenty-five thousand (25,000) belong to the United States. Of these, fifteen thousand, at least, would be regarded as injurious, from preying upon material serviceable to man. The amount of harm inflicted by many of these is inconsiderable; and probably not exceeding one-half of the number, or from seven thousand to eight thousand may justly be regarded as insect pests.

The number of fruit insects cannot be definitely stated. Four years ago I published a list of one hundred and seventy-six species of insects depredating on the apple. Since then I have enlarged the list one-fifth, making it to contain at present two hundred and ten species. Doubtless a thorough examination of published and manuscript records of food-plants, and direct observations in the orchard, would extend the number to nearly if not quite three hundred. With this as a basis, we may safely conclude that the number of fruit insects in the United States is at least one thousand.

AN UNKNOWN CURRANT INSECT.

And every year is adding to the number. Several new ones have come under my observation the present year. To one of these, of more than ordinary interest to me, I will ask your attention, in the hope that if its operations are wide-spread, the unknown insect inflicting the injury may be discovered while engaged in its oviposition, by some one of you, as otherwise its identification may elude us for years.

During the latter part of May and early in June, the tips of the new and more vigorous shoots of both the black and the red currant were observed, in gardens at Albany and vicinity, to be girdled, drop over, wither, and finally to break off and fall to the ground. The girdling is done by five or six sharp, deep and rather long incisions in the same plane, nearly surrounding and severing the stalk, and seeming as if made by strong mandibles. It is entirely different from the two circles of punctures made by the well-known raspberry cane girdler, *Oberea bimaculata* oliv., and moreover, the oviposition is within the tip that falls to the ground—not in the standing cane. It would therefore be difficult to rear the insect from the egg, deprived, as it would be, in confinement, of its natural conditions. The girdling is probably done during the night.

HOW INSECT RAVAGES ARE TO BE MET.

And now, to proceed to the more practical part of my paper: What must the nurseryman and the fruit grower do, that they may effectually meet these annually increasing insect ravages; the plant diseases of rust, smut, blight, mildew, etc., to which I have referred, belong to, and are left for, others to discuss.

I need not urge upon the members of this Society the importance of their recognition of the amount of harm to which they are exposed from insect injuries. Individual experience has taught the absolute necessity of such recognition. Cer-

tain it is, that he who will hereafter achieve the best success in the growth of fruit or fruit trees, will be he who has best informed himself of insects and how to deal with them. In the hands of such, the business will continue to be profitable, while the thriftless, careless and ignorant will have to seek other occupation, more congenial to his quiet tastes and easy-going nature.

While the fruit grower has not the opportunity for becoming a technical entomologist, he may at least acquire such a general knowledge of the elements and applications of economic entomology as are taught and explained in scores of publications issued gratuitously during the last few years by several of the States and the General Government, for the sole and only purpose of diffusing broadcast knowledge so important to individual and national prosperity.

May I venture to offer what seems to me, from my stand-point, some reasonable requisites of the successful fruit-grower of the future?

1. He should be acquainted with all of the more common insects that occur, or are liable to occur in his vicinity—their names (not necessarily their scientific ones), the nature of their injuries (if injurious), their more important habits, and be able to identify them in their different stages.

2. He should be so familiar with his ordinary visitants that he would detect the advent of an unusual or new form, so that it could be promptly submitted for such study as it might need.

3. He should be able to distinguish between his insect friends and foes, that he might not unwittingly destroy the former, or employ such remedies against the latter as to involve both classes in a common destruction, accomplishing thereby more harm than good.

4. He should be able to refer them to the orders to which they belong in classification, that he might speak or write of them understandingly and properly—not grouping all under the name of "bugs." The commonly accepted orders are but seven and may be easily learned. They are these:

1. Hymenoptera—Bees, wasps, hornets, ants, saw-flies, etc.
2. Lepidoptera—Butterflies and moths
3. Diptera—Flies, mosquitoes, gnats, etc.
4. Coleoptera—Beetles.
5. Hemiptera—Plant-lice, scale-insects, tree-hoppers, etc.
6. Orthoptera—Crickets, grasshoppers, etc.
7. Neuroptera—Dragon-flies, May-flies, caddis worms, etc.

5. We should know the manner of insect feeding, so as to employ the proper class of insecticides.

6. He should be informed of the method of preparation and of application of the best insecticides.

7. He should experiment with such remedies and preventives as his own observation and experience may suggest.

8. He should avail himself of the publications in economic entomology relating to fruit pests. These have become numerous and cannot fail of proving of great service.

The first three of what I have named as requisites of the successful fruit-grower, viz.: Names of insects, recognition of new forms and discrimination between foes and friends—may be largely met by the use, in connection with observation of the living insects, of the volume entitled, "Insects Injurious to Fruits," by William Saunders. It is an exceedingly valuable compilation of most that is desirable to be known, for practical uses, of our fruit insects, and has been prepared by a gentleman, whose long experience as a fruit culturist, together with a high reputation as an entomologist, had in every way fitted him for the work which has been so successfully accomplished. The volume—an octavo of over 400 pages with illustrations on almost every page—is published by the well-known publishing house of J. B. Lippincott, Philadelphia, of whom it may be ordered.

For the fourth requisite—for some knowledge of the orders in which insects are grouped, and in addition, a comprehensive idea of the families in which the orders are divided, I would recommend the purchase of Dr. Packard's "Guide to the Study of Insects." It is a large octavo of over 700 pages, abounding in illustrations, and is well adapted to the wants of those who desire some accurate and general knowledge of the insect world. The eighth edition was published in 1883, by H. Holt & Co., 29 W. Twenty-third street, New York City; price $5.

For the fifth requisite—a knowledge of the manner of feeding, it is necessary in the employment of remedies to be able to distinguish between biting insects, the Mandibulata, which are provided with mandibles, or jaws, and sucking insects, the Suctoria, furnished with a proboscis for extracting the sap of plants. The former are killed by the application of poisonous substances to the surface of the leaves or other parts of the plants on which they feed, while the latter, living only on the interior juices, are entirely unaffected by such applications. Of this last class, are all of the plant-lice, or Aphides, the scale insects, bugs proper, and, in short, all comprising the extensive order of Hemiptera. Against these the strongest arsenical preparations are of no avail, but they are vulnerable to applications that will affect them through their breathing pores, as, for example, kerosene, which closes these pores and produces suffocation.

INSECTICIDES.

The sixth requisite named, is a knowledge of insecticides, and of the means for applying them.

Not many years ago the only known methods of combatting insect pests, were hand-picking, beating from shrubs or jarring from trees on sheets spread underneath, attracting to lights or fires, and taking up and burning the infested plants. As insects multiplied and more ample means for their control were required, insecticides, so called, were discovered. Twenty years ago, when a beetle whose home was in the Rocky mountains, had, at the approach of civilization, abandoned its wild Solanum food-plant for the more nutritious cultivated one, and was rolling eastward over the Western States as steadily and as irresistibly as a tidal wave, the timely discovery by a citizen of Illinois that Paris Green was an effectual remedy for it, at once brought under control the ravages of the devouring pest, and made the continued cultivation of the potato a possibility. Ten years thereafter London purple, a residuum in the manufacture of analine dyes, was found to be almost equally efficacious against the Colorado beetle; and, as the fruit of experiments since conducted, we have now in these two arsenical compounds, insecticides effective against nearly all of the mandibulate insects which feed exposed on such vegetable substances as we or our domestic animals do not require for food.

The need of reaching the large order of suctorial insects which are not affected by the arsenites, led to the discovery of the value of kerosene as a destroyer of insect life. It was found to be fatal to every insect to which it could be applied. As in its undiluted state it is also fatal to vegetation, means were sought, and were speedily found, for reducing it to any desired degree. Often as the methods of preparation of what are known as "kerosene emulsions" have been published in our agricultural and horticultural journals, it may be of service to you to give the most approved method in a single short sentence.

The best emulsion for general use is produced by violently agitating through the rose of a force-pump until emulsified in a homogeneous mass, two parts of kerosene to one part of a hot soap solution, made by dissolving a half pound of common soap in one gallon of water.

The ordinary dilution of the above emulsion for use, is with nine parts of cold water.

Of the various other insecticides with which the fruit-grower will find it to his advantage to be familiar, as hellebore, pyrethrum, carbolic acid, coal tar, tobacco, etc., I will not speak, but will refer you to publications in which they are fully discussed, and which constitute a part of that literature of economic entomology, which should find place in the library of each one of you.

The necessity of limiting the size of this volume, compels the presentation of an abstract of the concluding pages of this paper, prepared by its author and used with his permission.

PUBLICATIONS RELATING TO FRUIT INSECTS.

After paying a high compliment to the Entomological Division of the Department of Agriculture at Washington, for the admirable work it had accomplished in the study of insects, discoveries of insecticides, and invention of machines and devices for their application, the speaker commended the publications of the Division, in the annual report of the Entomologist, Prof. Riley, and in its occasional bulletins (fifteen now issued), as of great value to the fruit-grower. There should be no difficulty in getting the annual reports, either from Representatives in Congress or from the Commissioner of Agriculture, as they are included in the report of the Commissioner, of which Congress annually orders an edition of four hundred thousand copies.

Of the other publications in economic entomology of which commendation was made, was the following:

The four reports of the United States Entomological Commission.

The Bulletins of the above Commission, especially No. 7, on "Insects Injurious to Forest and Shade Trees," by Dr. Packard.

Reports of Dr. Fitch on the Noxious and other Insects of the State of New York.

Reports of Prof. Riley (nine) on the Insects of Missouri.

Reports on the Insects of Illinois, fourteen in number.

The American Entomologist, three volumes.

The Practical Entomologist, two volumes.

The special value of each of the above to the fruit-grower was pointed out, as also their general character, where they were to be obtained, and the price, when known.

In conclusion, the speaker expressed his belief that the means he had indicated for meeting insect depredations were not difficult to employ. Compliance with the requisites that he had made would not only yield a pecuniary reward, but at the same time add to mental wealth, enlarging and enriching the mind by opening up to it new sources of pleasure as one is led from the simple contemplation of the beautiful, curious and wonderful forms of insects, to their various habits, and the surprising instincts or the shadowing of reasoning powers so frequently displayed The study of the myriad insect world, even apart from its utility, could not fail of being a fascinating adjunct to the pleasurable pursuit of fruit-growing.

SUPPLEMENTARY PAPERS.

The following valuable papers were presented by their titles, the time of the convention being too fully occupied to have them read at length.

Honesty in Testimonials and Recommendations.

BY M. CRAWFORD, CUYAHOGA FALLS, OHIO.

This is a subject of special importance to Horticulturists. Being a progressive people, they are anxious to keep up with the times and raise the best that can be obtained; and they are obliged to depend largely upon the testimony of others in regard to the merits of the stock they buy.

Horticultural societies have done much to encourage the raising of new fruits and many of these are introduced each season. The fact that a variety is new, however, is not sufficient to secure its ready sale. It must possess merit or have the reputation of doing so, and this reputation, whether deserved or not, is gained by means of testimonials.

Let us notice a few of the ways in which new fruits obtain a better name than they are able to sustain.

A fruit-grower originates some new variety which, in his estimation, possesses great merit. Nor is he alone in his opinion. He favors his friends with samples of the fruit, and some of them pronounce it the best they have ever seen.

A few are permitted to fruit the new variety—probably under very favorable conditions—but if they discover faults in it, the owner is so possessed with the idea of its superiority that they dislike to undeceive him, and so they say what good they can and leave the other part unsaid. They speak the truth but not the whole truth, and the new variety becomes popular only to be cast aside when others find out the faults which those who have tested it already know, and ought to have told in the beginning.

Years ago it was customary to obtain testimonials from preachers, as such were supposed to be entirely reliable, but fruit-growers have learned that however truthful preachers may be they are not necessarily experts, and their testimony is not always conclusive. The same is true of many others who mean well but are not competent judges. They recommend new varieties in strong language because in their narrow experience they have seen nothing better. Others are premature in their judgment and write before they have had the means of informing themselves. For instance, a man becomes interested in the strawberry and plants a hundred varieties in the fall, three or four plants of each. The following June he publishes a report to enlighten the people, but the people would be better off without it.

Sometimes the man who can tell about a new thing is at a premium, and this induces some to tell more than they know—to give information which they hope to gain at a future time.

It is often the case that where new sorts are sold at a high price, they receive extraordinary cultivation, and this brings out their best points, and so the reports concerning them are more favorable than they are later, when the commercial grower gets possession of them. Still more mischievous is the custom of giving new varieties extraordinary cultivation before they are dissiminated at all, thus obtaining wonderful specimens and allowing the public to believe that they were

produced by ordinary means. It is all right to give high culture, but when the results are exhibited the method by which they were gained should be reported.

Last of all, a man may give a false testimonial for profit. He may be a silent partner, or he may have the promise of a share of the gains in consideration of his influence. It is a lamentable fact that there are a few men who will lie for money, and the mischief they do in horticulture is incalculable. In contrast with these, and at the same time in harmony, we find those horticultural gossips who rarely test a new thing, but are always ready to condemn what they have not seen for the sake of the dear public. If it is wrong for one class to over-praise, and thus induce the public to buy things not worth their price, it is also wrong for the other to speak ill without reason, and thus deter people from purchasing a really good thing. Both classes are false witnesses, and both have a strong tendency to discourage enterprise in horticulture.

Perfect truthfulness is the most important characteristic of a testimonial. The honest course is the right one, and it is the safest and best for all concerned. Any other results in loss of time, money, and confidence on the part of the purchaser, and the loss of all self-respect and, finally, of trade on the part of the seller.

Heretofore it has been very difficult to get new varieties fairly tested. Few know this unless they have had the experience. Originators have found, to their sorrow, that in too many cases their seedlings intrusted to others for trial have been propagated with all haste, so as to have a stock ready at the time of introduction. This state of things has led to much of the dishonesty in testimonials, of which complaint is made; but we are now on the eve of better times in this respect.

At the experiment stations originators can have their seedlings tested by experts without risk, and the people can get the exact standing of all new sorts. Several of these stations have been in existence for years, and the number is about to be increased. Those already established are in the hands of men who are entirely disinterested and eminently reliable.

No man ever did more to encourage the raising of new varieties than the late President Wilder, and we must concede that he acted wisely. Progress can be made in no other way. But this good work is being brought into disrepute by dishonesty in testimonials and recommendations. It is possible to remove this difficulty now that the State has provided means by which new varieties may be impartially tested, and correct reports given. If a grower has a new fruit that he meditates introducing, let him show his confidence in it by sending it to the stations for trial. We require fertilizers to be analyzed by the State—why should not new fruits bear the State testimonial?

The Cranberry Industry.

BY REV. JOHN H. BRAKELEY, PH. D., BORDENTOWN, N. J.

The cranberry is the fruit of an evergreen woody vine (*Vaccinium Macrocarpon*) having upright fruit stems, and growing in wet places, chiefly in and on the margin of peat bogs. Its edible qualities have been known time out of mind, as the aboriginies of our country were accustomed to gather the wild fruit as a part of their winter stores. The early settlers, too, soon learned to appreciate it. More than two centuries ago, one of these, writing from Burlington county, New Jersey, giving a description of the wonderful productions of their new home, says: "There grows in the swamps a berry about the bigness of a cherry, which make excellent sauce to be eaten with the wild turkies and deer, which abound in the same swamps." And yet, strange as it may seem, nearly two hundred years were suffered to elapse before serious efforts were made to rescue it from its native swamps

and place it under cultivation. The time came, however, during the fifth decade of the present century, when some earnest, far-seeing men on Cape Cod determined to test the matter fully, and such was their success that before the middle of the century had been reached, they had clearly demonstrated that the wild cranberry could be cultivated with profit, and that the unsightly marshes where it grew naturally could be transformed into veritable gardens of great value. To effect this, however, much fruitless effort had to be expended, many failures recorded, and much ridicule endured by the enthusiastic few who believed that it could be done. So Massachusetts has the honor of showing to the country how vast tracts of useless territory may be placed under cultivation and add largely to the food supply of her increasing millions. New Jersey soon learned the art, but so recently, that at the close of the late war she had comparatively but a small area under cultivation. And still more recently Wisconsin began to turn her marshy lands to account. Others of the New England States, with New York also, and some of the Western States besides Wisconsin, have lands upon which the wild vine grows naturally, and have engaged in the culture of this fruit. And as the supply increased the demand has increased with wonderful rapidity. The wild berries formerly gathered from the swamps, amounting annually to only a few scores of bushels in any one neighborhood, seemed to be in light demand, and met with only a slow sale. Within the past half century a merchant in Burlington County, New Jersey, thought he saw a chance for speculation by getting up a corner in the crop, and purchased all that could be had, which was doubtless less than 100 bushels, paying for them sixty-two cents per bushel. But the demand fell below his expectations, and he lost money by the transaction. But since cultivation has become a success, the demand has grown immensely, and last year's crop of more than a half million bushels all went into consumption at remunerative prices.

The early cultivators having discovered that where sand was spread over vines growing naturally, it not only stimulated the growth of the vines, but also increased the size of the fruit and added very largely to the quantity—hence sand appeared to be the great desideratum, and for the time was looked upon as the only requisite for successful culture. Swamps were cleared up and covered with a coating of sand in which the vines were planted. These usually grew rapidly, covering the entire surface in four or five years, when they would yield a fair crop, and continued to do this in some instances for several years. But soon they began to languish and lose their healthy, vigorous appearance. Evidently something was needed. That something was found to be winter flowage. Arrangements had accordingly to be made to cover the vines with water during the winter. But in many cases this could not be done, either because the land was too high or there was an insufficiency of water. Such bogs ceased to be productive and much loss was thus incurred.

But another difficulty soon arose, rendering Winter flowing absolutely necessary. There exists in our swamps a small cream colored moth, the larvæ of which feed on the leaves of the whortleberry and cranberry and which has become known to science in recent years as *Teras* (formerly *Tortrix*) *Oxycoccana*. A space thickly covered with cranberry vines is a most inviting field for this insignificant little moth, furnishing abundant pasture for her numerous progeny. As a consequence they so multiplied as in many instances to destroy every green thing on the most promising bogs, giving them the aspect of having been scorched by fire. Hence the name "fire worm," given it in some localities. It is also known as the "vine worm" or "web worm." A careful study of the habits of this insect, made known the fact that

there were three broods each year, and that the parent moth which continues the species emerges in Autumn, survives the Winter, and deposits its eggs usually before the 1st of May. So where a bog is entirely submerged during the Winter and the water held until this period, which can be done without injury to the vines, it serves as a complete protection against this pest.

But scarcely had the cranberry grower learned to combat successfully the fire worm before a new and more formidable enemy appeared, known scientifically as the *Anchylopera vacciniana*, with the common name the same as the Teras, but with very different habits. The perfect form is a small gray moth, much smaller than the Teras. It has but two broods in a year. The last brood of moths emerge about the first of August, deposit their eggs on the under side of the cranberry leaves, and in the course of five or six days die. The eggs are covered with a varnish impervious to water, so that the regular Winter flowing of the vines has no effect upon them, but after the water is withdrawn in the Spring the larvæ hatch and enter upon their work of destruction. This they do effectually, the second brood often being sufficiently numerous to devour the young fruit as well as the leaves. To stay their progress various remedies have been tried with greater or less success. White helebore, when properly applied, will destroy most of them. Holding the water till the middle of May and then drawing it slowly, so that as it grows warm on the margin, it will hatch and drown the larvæ, has been found to answer on bogs where the fall is not too great. Kerosene emulsion also has been used with good results where the vines are free from grass. But the only remedy which has proved completely successful is re-flowing the bog after the larvæ have hatched in the Spring, say from the 15th to the 20th of May. Hence the necessity of a good supply of water, so that the vines may be covered in two or three days, or what is better still, reservoirs of sufficient capacity to fill the bogs in a very short time.

From these considerations it may be seen how important is an abundance of water in cranberry culture.

But there are other obstacles in the way of successful culture. Prominent among these is the disease known in New Jersey as the "scald." This made its appearance about fifteen years since, and but few bogs have escaped its ravages. A number of theories have been devised to explain its origin, but up to the present no satisfactory explanation has been given. Many remedies also have been suggested and tried, no one of which has proved effectual. The aid of the general government was invoked and an expert was sent to the cranberry region to investigate the matter, but no practical information has been elicited. Many thousands of bushels are annually destroyed by it. Last year the owner of a large bog reported his crop prospect in August at 8,000 bushels, but at the close of the season he informed me that he had gathered only half that quantity, the "scald" having taken about 3,000 bushels, and an early frost 1,000 bushels. Some years it is worse than others, much depending upon the character of the weather. Often it begins in July; at others it is delayed till after the middle of September.

Late frosts in May or June not unfrequently destroy the tender shoot developing from the fruit bud, while scarcely a season passes without a portion of the fruit being destroyed by early frosts before it is gathered.

I have now named the leading obstacles in the way of successful cranberry culture, a part of which may be avoided by a judicious selection of lands about to be planted in vines, while others cannot be provided against by any human foresight.

The conditions most likely to secure success are these: A peat or muck bog,

so situated that it can be thoroughly drained; sand near by which is to replace the turf, roots, etc., when removed; water for Winter flowing with a dam sufficiently high, that all the vines may be covered. In addition the water supply must be sufficient to reflow the bog in two or three days, or it must be so located that reservoirs may be constructed for this purpose. Many bogs now yielding fair crops of fruit annually do not possess all these requisites, and as a consequence are in danger of the attacks of insect enemies, without means of protection should these make their appearance.

The cost of planting in vines a bog possessing all the requirements necessary to success, will vary from $250 to $500 or more per acre. Much will depend upon the length and height of the dam required, the distance the sand has to be brought and the cost of reservoirs for reflowing. In Wisconsin much has been done in simply improving natural bogs at a cost of from $10 to $20 per acre. This may seem to be an economical arrangement, but experience has shown that money so expended is less likely to make satisfactory returns than an equal amount expended on lands which possess all the requisites of a really good bog.

For three or four years after the vines have been planted, it is necessary to remove the grass and weeds which spring up among them. By that time the vines will have taken complete possession of the ground, and but little attention will be required. One of the sedge grasses (*Carex Cullata*) and two or three rushes often dispute the ground with the vines for years, and if not removed, will do serious injury. A light crop may be expected the third year after planting, and a full one the fourth or fifth year. Ordinarily a bog will continue in full bearing from ten to twelve years, without showing signs of deterioration. Bye and bye, however, the vines will begin to die on small sections. These dead vines the careful culturist will remove at once, and plant with new vines. And taking the hint that the vitality of the vines is becoming exhausted, he will have recourse to the measure necessary for the restoration of this vitality. The usual method is either to mow off the old vines and thus get a new growth from near the root, or cover them with a new coat of sand. The latter method is more frequently practiced than the former, as it does not involve the necessity of the loss of a crop or two in the renovation of the bog. In this way a bog may be kept up for an indefinite period of time.

Cultivation has improved both the size and quality of the berry, the cultivated berry losing the slight acidity which characterizes the wild one. In New Jersey 100 bushels per acre is considered a fair yield for an entire plantation. But on small tracts the yield is sometimes much greater than this. I have known three bushels gathered from a single square rod, being at the rate of 640 bushels to the acre. Two years ago, I gathered 1,100 bushels from thirteen acres, being over 300 bushels to the acre. But such a yield is not common.

The number of well defined varieties of the cranberry, depending upon shape, size and color, has not been fully ascertained. I am acquainted with ten of these, but this does not cover the whole list. In New Jersey, when a new bog is to be planted, the custom has been to procure the vines from the neighboring swamps, where they grow naturally, no attention being paid to the variety. But in New England considerable attention has been given to the selection of, and propagation of choice varieties, and in this way more saleable berries have been secured. Prominent among these is the Early Black, known to the trade as Cape Cod berries. While a poor keeper, being among cranberries what the Fall Pippin is among apples, and inferior to some other varieties as a sauce producer; yet ripening early, and being highly colored, it commands an extra

price in the market. And now it has become quite common in New Jersey for persons putting out new bogs to plant with the Early Black vines from New England, so that in a very few years we may reasonably look for an over production of Early Blacks. Some other varieties, remarkable for their size, have been brought under cultivation, for which extra prices are obtained. Besides differing in shape, color and size, cranberries also vary in their culinary properties. While the highly colored, over ripe berries are usually preferred because of their appearance, careful observation has shown that varieties not so highly colored make a more delicate sauce and in greater quantity than the over-ripe ones.

The question naturally arises, has cranberry culture been a financial success during its experimental period now in progress. Some doubtless have made money in this line of business. Those who were fortunate enough to secure locations where the rot did not make its appearance, or where it was not very destructive, and who have water sufficient for flowing and re-flowing, usually get very satisfactory returns for their investments. But I fear these do not constitute the majority of growers. A large portion of the vines planted in New Jersey, and doubtless in other cranberry regions, are on grounds not fully adapted to the purpose. The few successful ventures have been widely published, and many have rushed into the business without sufficient care in the selection of suitable grounds. Ignorance and haste have thus been the cause of much loss. And yet scarcely a year passes without witnessing a large addition to the acreage planted in vines. On this account intelligent cranberry growers have for years feared an over production of this fruit. This fear was realized in 1885. Being an unusually fine growing year, with an exemption from hurtful frosts, more than three-fourths of a million of bushels were harvested. The largest crop of any preceding year had fallen short of 500,000 bushels. The supply thus largely exceeding the demand, prices were very low, and few growers received enough for their crops to pay for the gathering and marketing. Last year a severe frost destroyed nearly the entire crop in the West, thus preventing a repetition of the disheartening results of the preceding year. A writer in the Western Farmer sums up the situation in Wisconsin in the following words: "In 1885 there was such a great over production that hundreds, if not thousands, of barrels were dumped into Lake Michigan in Chicago, and the growers had even to pay the charges for hauling their crops into the lake. * * * We have had three years of hard times; one brought a very small crop at $10 per barrel, the next brought the largest crop ever produced, and fetched to many less than its cost of raising, while last year brought no crops at all to many. * * * Think of it that after the fruit is put into barrels and shipped at a cost of about $3 per barrel, the honest commissioner sends you before next Spring $1.30 per barrel, which were the products many received for the great crop of 1885, having been worse than the last year's crop, when we had no crop at all." Indeed it is doubtful whether cranberries can be grown with profit in Wisconsin except in a very few favorably located situations. Frost often does much harm, sometimes sweeping away almost the entire crop, and when this does not happen it is liable to be so large and prices so low as not to pay the cost of gathering and marketing.

During the past ten years considerable effort has been made to introduce this fruit into Europe, specially into England, and to some extent also into Germany and France. The result of these efforts, however, has not been satisfactory. N. R. French, Esq., the able statistician of the American Cranberry Growers Association in his report on the very large crop of 1885, uses the following language: "At

the commencement of the season, the Fruit Growers Trade Company looked upon the great crop and the inevitable low prices as an opportunity for a largely increased export trade. They had several years ago, when prices were low succeeded in exporting nearly 2,000 crates without loss, and hoped to more than double that small figure the present season.

"Shipments were made to Liverpool, London, Glasgow and Burmingham.

"The first reports were very favorable and increased shipments were hurried forward, but soon there was a peremptory cable message with one word 'Stop.'

"The upshot of the whole business is that about 1,200 crates seem to have glutted the entire United Kingdom, and are likely to bring loss upon the company.

"At Dresden, Saxony, there are so many resident Americans, that a grocer who caters for them gives us an order every fall for a small lot of cranberries and cranberry sauce. When filling this order last fall, we concluded to venture by the same ship a consignment of twenty-five crates to Hamburg. In due time our consignee advised that he had offered the fruit for sale, and the best bid he could get was 4s per crate, which he declined, and sent the lot to Liverpool, where he noticed they were quoted at 10s, and where they were finally sold at 8s. * *

"At present the persistent efforts of the last ten years to introduce cranberries abroad have had very little effect beyond what Americans across the sea require." Not very encouraging truly, still perseverance may yet reap its appropriate reward.

Cranberry culture is still in its infancy. Much has yet to be learned before it can be fully depended upon as a certain source of income. Doubtless much land will continue to be planted in vines, which is not fully adapted to the purpose, and which consequently will result in loss. Over-production also will at time cast its dark shadow over the entire industry. New insects, too, with unknown habits will continue to appear as in the past, and perplex the most intelligent cultivator, and new diseases blight the fairest promises. And yet, I sincerely believe that the cranberry industry has a grand future before it. Where this delicious fruit has come into use, there seems to be no article of food to take its place. Alike welcome on the table of the rich and the poor, there are but few other articles of food so universally sought after. To the man with a good appetite or a poor appetite, it is alike welcome. And when its anti-scorbutic properties become more fully known, its use must become greatly extended. It ought to be, and doubtless will be, before many years, introduced into the navies of the world, and no vessel will enter upon a long voyage without an ample supply of cranberry sauce among its stores. With an abundance of this anti-scorbutic at hand there will be little danger of scurvy, that disease so dreaded on shipboard. The fact that it may be so prepared in the form of a most delicious sauce as to keep in perfect condition for years renders this possible. That it may be so kept even in warm climates, I give the following letter, from the steward of the Duke of Edinburgh, to whom the agents of the Fruit Growers Trade Company had sent a case of their sauce:

H. M. S. Sultan,

BASIKA BAY, Aug. 18, 1877.

Dear Sir: The preserved cranberries you kindly sent me in February, 1876, for service on board this ship, have only now been brought into use, and I find them excellent.

They have had a good trial, having passed through two summers in the Mediterranean, and being as good now as when brought on board. I have no hesitation in giving them a place among the best preserves on board ship.

Your ob't servant,

W. GARDNER.

A Stock Company, French & Co., agents, 180 Reade street, New York

Then with a cautious extension of the planting, sufficient to meet the increasing demand from year to year, but not enough to overstock the market, the industry may be made to produce satisfactory returns to those engaged in the business.

I append a summary of the crops of the country for the past four years, taken from the proceedings of the American Cranberry Growers' Association.

1886.	
New Jersey	225,000 bushels
New England	285,000 "
Western States	42,000 "
Entire crop	552,000 "
1885.	
New Jersey	198,125 bushels
New England	280,879 "
Western States	264,432 "
Entire crop	743,436 "
1884.	
New Jersey	124,648 bushels
New England	130,583 "
Western States	24,783 "
Entire crop	280,014 "
1883.	
New Jersey	118,524 bushels
New England	141,964 "
Western States	135,507 "
Entire crop	395,995 "

Fruit Breeding and Seed Extinction.

BY DR. E. LOUIS STURTEVANT, DIRECTOR NEW YORK AGRICULTURAL EXPERIMENT STATION, GENEVA, N. Y.

If we should seek to tabulate modern achievements in horticulture, we would have to confess how little has been accomplished commensurate with the number of workers and the large field over which efforts have been attempted. If we should ask ourselves fairly in what respect we of the present excel those of the past, I think we would find it difficult to prove any great achievement. We would have to content ourselves, in all likelihood, with an enumeration of the successes gained in diffusing an interest in horticultural matters, and in the increased production of various fruits. Then perhaps we should have to acknowledge to ourselves that the apparent success in producing new fruits has come more from the attention that has been given, whereby desirable happenings have been preserved and disseminated. If such be the fact, and I believe it to be so, it is time to have it generally known in order that there may be a stronger public support of efforts designed to induce a real progress.

Science has been truly defined as systematic knowledge, or, as is better expressed, knowledge reduced to a system. There has been all too little of this in the pursuit of horticulture, and yet analogically reasoning upon conditions of success would lead us to believe that a systematic study of the tree as well as of its fruit, and of the physiology of plant seeding and variation, would suffice to furnish methods of practice which might be of great promise. That there has been some little desultory work done in this direction I am willing to acknowledge, but the self-interest of practical horticulture should lead to the demand, that, at public institutions designed for the benefit of agriculture and horticulture, the essentially scientific work should be attempted, and all work of the character which is now so well done by amateurs and professionals in practical life should be left with those who do this already sufficiently well. There is room in horticulture, and a pressing need, for the highest scientific talent, and attempts like those represented by Dr. Englemann's work upon grapes of the Bushburg catalogue, and of Mr. Munson upon the grape in Texas, should receive official commendation and encouragement on the part of this association.

In the present lack of thoroughness in horticultural knowledge and in the nearly

complete ignorance that we are in concerning the co-relations between inward and outward properties, it ill becomes me to assume mastery, and hence I do not care to discuss the co-relations between seed extinction in fruits (and quality) in any other point of view than that of a student. In the transactions of the Massachusetts Horticultural Society for 1880, is an essay entitled "Seedless Fruits," which incorporates the evidence that I had gathered up to date, showing that there is a very strong probability that such a co-relation exists. Since 1880 I have collected evidence which strengthens the position therein taken, and while I have shown a strong theoretical probability in favor of this view, yet I am sorry to say that I am unable at date to offer the evidence of decisive test. Of the many attempts made in this direction, the results of all can be interpreted as favorable to this view and not as antagonistic, and this, perhaps, in the present state of knowledge upon these questions, is as good a success as can reasonably be expected. To recall to mind to this expert audience the fact that the sweetest and honiest peaches are apt to have a split stone, that those accidental plums which have a split stone are of surpassing excellence for their variety, that the best of cherries are apt to have the stone deficient in a well developed embryo and that in general a lessening of seed accompanies exceeding high quality in other fruits is but to suggest a line of trial which all analogical and test reasoning already at hand justifies; and this is, that, in attempting to raise seedlings for the best improved varieties we should make special effort to obtain seed from the split kernels in peaches or plums; from those varieties of apples and pears which exhibit a deficient seeding, and from the nearly seedless fruits of the grape, current, gooseberry, etc.

The same line of thought concerning the co-relation between seed extinction and quality, suggests also the allied thought, which has as well many analogical facts in its favor, that a method for obtaining early varieties should be legitimately attempted in the line of planting the seed of unripe fruits. It is within the bounds of a reasonable probability that by growing the seed from unripe strawberries, an unripe peach or an unripe apple, the chances of increased earliness would be very much enhanced, and if we can escape the penalty of too great an enfeebled state of the plants, practical gain may be ultimately looked for with confidence.

The doctrine of heredity, especially that branch which is included in the name atavism, has also a close relation to the present subject, but the theme is too vast for the present discussion. Heredity is a force that holds species to their type. Hybridity tends to deviate from the type and promote atavism. Heredity in turn tends to purge the species of hybrid contamination. Within this conflict of opposing heredities, seed extinction, or the tendency thereto, seems to be a usual product. We may hence reasonably assume that as seed extinction is an accompaniment of weakening powers of opposing heredities, planting seed from nearly seedless fruits would frequently give us seedlings in which heredities have become neutralized and in which the acquirements gained through cultivation would exert a greater power.

So far, therefore, as my present knowledge justifies, I feel that I am safe in recommending to the intelligent seeker for new varieties, high culture, hybridization and the use of seed from resulting fruits which contain seed diminished either in number, size or protective covering.

The Relation of Seed Production to Cultivation.

BY L. H. BAILEY, JR.

There seems to be a considerable confusion of opinion concerning the supposed relations between seed production and cultivation. There is a very general notion that production of seeds lessens in direct proportion to the departure, through cultivation, of the plant from the first, or wild type. This supposition, it occurs to me, is but partly true, and even when true, is misleading.

For the present purpose the relation of seed production to cultivation can be sufficiently studied under three general heads, the first of which discusses selection more particularly. By the term seed production I mean to refer to the seed product of the individual fruit, not to that of an entire inflorescence or plant.

1. Seed production has increased, as a rule, in those plants which are cultivated for their seeds. Man would naturally and almost unconsciously select for sowing those seeds which are borne in the most productive fruits. In this way a slow, but continuous, selection has augmented seed production, many times, no doubt, almost independently of cultivation. Examples of this increase may be found in certain tropical plants, and beans and peas. Of course the converse of this rule will be true in those cases in which man desires a lessening of seed production in order that some advantage may be gained for the seeds that remain.

2. Seed production has decreased, as a rule, in those plants which are propagated exclusively or nearly so by parts, other than seeds, which nature uses in their propagation. Under this caption may be cited the banana, sweet potato, potato, horseradish, some onions, and others. As a rule, all wild plants which propagate readily by tubers, offshoots, or similar means, produce comparatively few seeds, or in some instances, none whatever. In this connection it is only necessary to cite the instances of quack grass upon certain soils, Canada thistles, and some potamogetons, in support of this proposition. The production of seeds and fruit is an exhaustive process, demanding much of the plants vitality, and if this vitality is early diverted into growth of other organs necessarily the fruit and seeds must suffer. This explains why the early varieties of potates produce fewer seeds than the late varieties. The tubers form earlier in the life of the plant and the plant energy is diverted before the blossoms appear. If the tubers are not allowed to form, the plant produces flowers and fruits abundantly. This has been proved by Thomas Andrew Knight. For the same reason, flowers on young and thrifty fruit trees do not set fruit, although the flowers may produce good pollen and perfect pistils. Luxuriant growth make the first demand upon the young tree and seed production suffers. Cultivation lessens seed production and fruit productions in some of these cases simply because it exaggerates the opposing methods of propagation by demanding larger tubers; but the cultivation, of itself, is not opposed to seed production.

The case of the banana is unique in this section, inasmuch as the rootstock is not the part especially demanded by man. Yet there is reason to believe that in this case selection, rather than cultivation, has had the most to do with the seedless character of this singular fruit. Perhaps a discussion of this case should fall more properly under the next caption.

3. Seed production bears no immediate relation to cultivation in those plants which are cultivated for the flesh or pulp of their so-called fruits. As a rule, the cultivated varieties of apples contain more seeds than the wild plants of Europe. Forty specimens of the wild crab (*Pyrus Malus*) of Central Europe produced an aggregate of 256 seeds, or an average of 6 2-5 seeds to each fruit. Forty Northern Spys contained 481 seeds or an average of 12 1-40

to the fruit. Normally, the apple should contain ten seeds, two in each carpel, but some of these Spys had fifteen seeds and one had eighteen. Yet some other varieties of apples contain fewer than the normal number, while some are almost entirely seedless. There is generally a slight increase in seed production as fruits develop away from the first type, especially if the fruits become larger. This is a natural consequence of the increase in size though it bears no constant ratio to this increase.

I am disposed to regard the seedless apples and pears in the light of seminal sports, exactly analagous to red apples, long apples, or other forms of variation; and I should not expect to find this character to possess much stronger hereditability than form or color. Relative seed production can be well studied in the tomatoes, as we have the wild type, or very near it, and numerous monstrous varieties for comparison. I submit a table of seed production in tomatoes:

VARIETY	No. of fruits in the pound	No. of seeds in the pound.	Average No. of seeds in a fruit.	WHERE THE VARIETY WAS OBTAINED
Red Cherry	101	7,312	72 2-5	Agricultural College (*Henderson*).
Kirsch rothe	68	4,830	71 1-3	Prussia.
King Humbert	7	645	92 1-7	Agricultural College (*Rawson*).
King Humbert	7¼	703	97	Prussia.
Criterion	7	1,095	156 3-7	Agricultural College (*Gregory*).
Conqueror	6	1,215	202 1-2	England.
Large Red	7	1,754	250 4-7	England.
Franc gross rothe	5	1,480	296	Prussia.
Hubbard's Curled Leaf	7	1,310	187 1-7	Agricultural College (*Wellis*).
Rouge grosse hative	8	1,608	201	France.
Tom Thumb	8	1,502	187 3-4	Agricultural College (*Rawson*).
Improved Large Yellow	13	2,250	173	Agricultural College (*Thorburn*)
Persian	5	1,398	279 3-5	Agricultural College (*Wellis*).
The Cook's Favorite	10	1,457	145 7-10	Prussia.
Boston Market	6	1,106	184 1-3	Agricultural College (*Rawson*).
Fulton Market	6	1,441	240 1-6	Agricultural College (*Gregory*).
New York Market	6	925	154 1-6	Agricultural College (*Wellis*)
Trophy	5	886	177 1-5	England.
Trophy	5	702	140 2-5	England
Trophy	6	1,450	241 2-3	Prussia.
Cardinal	4	941	235 1-4	Thorburn, N. Y
Livingston's Favorite	6	1,166	194 1-3	England.
New Red Apple	5	1,365	273	Agricultural College (*Gregory*).
Tilden	10	1,696	169 3-5	Agricultural College (*Gregory*)
Paragon	4	763	190 3-4	Agricultural College (*Henderson*)
Paragon	4	1,180	295	Prussia
Emery	4	781	195 1-4	Agricultural College (*Rawson*)
Acme	5	1,256	251 1-5	Prussia.
Mikado	2	435	217 1-2	Agricultural College (*Henderson*)
French Upright	5	583	116 3-5	Agricultural College (*Thorburn*)

Here the lowest average seed production is in the Cherry tomato, which is very nearly, if not exactly, the original form. There is a general, but uncertain, increase upon this average as the varieties depart from this variety. Yet this increase bears no relation to the extent of departure. Let us compare the Cherry and the Mikado. The fruit of the Mikado is about fifty times heavier than that of the Cherry, yet the seed production is only three times as great. If similar comparisons are made between the Cherry and other varieties we shall find other degrees of dissimilarity between development in number of seeds and size and weight of fruit. In other words seed production in all fruits which fall under this third caption, is an incidental variation, the same form, color, size, flavor, texture and other characters.

REPORT OF THE STATE FRUIT COMMITTEES.

Report of General Fruit Committee.

To the President and Members of the American Pomological Society:

GENTLEMEN:—The undersigned, on behalf of the General Fruit Committee, respectfully reports that in the month of November, 1886, and again in the month of June of the present year the usual circulars were addressed to the several chairmen of the State Fruit Committees.

Up to the present time responses and reports have been received from eighteen States and Territories. It is hoped and expected that before the proceeding are ready to be published that the reports from several other States, which are lacking, will be sent in. In two or three instances the circulars failed to reach the chairmen as addressed and were returned. In some cases absence from home or change of occupation prevented the chairmen from giving the subject their attention. I can only repeat what was said in the report of 1881:

"I would suggest that all the chairmen of the State Fruit Committees be notified of their appointment immediately after the meeting at which they are appointed, and asked to signify their intention to accept or decline, and in such cases, where they decline, or cannot serve, the Executive Committee be instructed to fill the vacancy at the earliest moment possible. The labors of the State Committees are of great importance to the Society, and therefore the greatest care should be exercised in selecting the several chairmen, not only with reference to qualifications, but also their willingness to serve."

I take this opportunity to sincerely thank the various chairmen who have labored so assidiously to make a good report. Their labors entitle them to be regarded as public benefactors, and I hope they will continue their laudable and important work.

Respectfully submitted,

W. C. BARRY,

Chairman General Fruit Committee.

ARKANSAS.

Reported by S. J. Matthews, of Monticello, Chairman of the State Fruit Committee.

Referring to my former reports, of which this is only intended as a slight supplement, would say:

My deprecation, two years ago, of the practice of planting the extra early peaches, to the well nigh total neglect, not only of other varieties of peaches, but also of other kinds of fruits, is in need of double emphasis at the present time. Peaches of the Alexander or Amsden type

have never paid here since they ceased to be a novelty, while now their superabundance, added to their tendency to rapid decay, render them decidedly unprofitable. We should plant, not only for home use, but for market, varieties to make a succession of ripening throughout the season. The notion has prevailed that it was useless to plant any sort for marketing in the Northern cities, which ripened later than the date at which the extra early sorts ripened in the latitude of those cities. This, however, is a mistake, since climate considerations render competition in peach growing, that is much north of us very insignificant. The following have proved the best market sorts here: Hale's, Troth, Rivers, Stump the World, Thurber, Oldmixon (free and cling), Columbia, Van Zandt, Mountain Rose, Picquett, Heath, Eaton's Golden and Austin's Late.

The present season has added to the proof of the great value of our high hills for peach orchards. For while in other situations there were failures, for the most part total, caused by late frosts; in the hills, with scarcely an exception, there were an average of two heavy crops of peaches.

The apple, except in the northwestern counties, is too much neglected as a market fruit in this State. True, that only in those counties can the late-keeping sorts be raised to profit. But Summer and Fall apples succeed to perfection nearly everywhere in this State, and they ship much better than peaches, frequently bring as much in the market and, except on high hills, are a much surer crop. Recommended for market: Astrachan, Red June, Horse, Taunton, Buckingham, Carter's Blue, Shannon, Horn, and Baccalinus.

Pears, in a general way, are unprofitable. The LeConte, thus far, being an exception. It has been in bearing here, to some extent, two seasons, and has borne well, carried well and sold well. But considering its coarse texture, insipid flavor and the extent to which it has been, and continues to be, planted, my advice regarding it would be "go slow."

CALIFORNIA.

Reported by Dr. J. Strentzel, of Martinez, Chairman of the State Fruit Committee of California.

I beg to present a bird's-eye view of the advancement of fruit culture in California. The progress is rapid, owing to the facilities of intercourse by railroad travel, spreading broadcast all desired information regarding the unique climate of the Pacific slope—the richness of its virgin soil and the wonderfully multifarious resources which attract the accumulations of Eastern capital to be freely employed in building up homes embellished by all the resources of art, as resting places for the lucky ones to enjoy life under most pleasing conditions.

With this transference of wealth the energy of the old settlers is stimulated to substitute the varied fruit industries for the primitive routine of grain growing. Close study is required in a careful selection of varieties most desirable for popular demand, to supply less favored regions with the most delicious fruits in Pomona's gift. We find the sunny, sheltered spots nourishing citrus fruit unconfined to the Southern part of the State, but extending the tributaries of Sacramento and San Joaquin rivers and along the coast range to the northern boundary of the State, dispelling the old myth of the golden garden of the Hesperides, for our thermal gardens are found on a line of 800 miles, tendering a home to the tree clothed in living green, star decked and crowned with gold.

Vineyards, by the thousand acres, now cover slopes formerly used for grazing. The raisin industry is extending with unexampled rapidity, doubling on last year. Our wine is gaining favor, and it is not questionable that sound table wines will

be the potent means to reduce the use of ardent spirits, and the twin habit in evil, that of tobacco.

We find the olive bending under a load of fruit on saplings three to four years from planting.

The process of drying and packing figs, so well adapted to be carried on in small homesteads, is constantly improving and expanding.

Necessity, the great inciter to invention, is converting the fruit of 100,000 prune trees to rival the best French productions. It was feared that this year's crop of apricots, unusually abundant, would go to waste, but as the season passes we find them all utilized by exporting in the fresh state, by canning, etc., with not enough left to supply demands for the dried fruit. The same conditions are applicable to peaches.

The demand for dried pears being limited, luscious Bartletts crowded the market and considerable quantities have been wasted.

Through efforts, mainly of Mr. Hatch, of Solano, the production of a very choice quality of almonds is assured.

The process of common grafting, now recognized as practicable with walnuts, will expand nut growing to be a most lucrative industry.

The Allegretti process of preserving fruit is gaining recognition and promises to be the means of protracting the keeping of fresh fruits.

By the happy blending of the interest of the grower with that of the transportation companies, over-production has been measurably averted by securing daily conveyance at reduced rates. Car loads of our surplus fruit are now distributed to the Eastern markets, finding a ready sale, and the demand is increasing.

CONNECTICUT

Reported by P. M. Augur, Middlefield, Chairman of the State Fruit Committee.

In reporting for Connecticut fruits, there are no very striking developments to report during the past two years.

The apple now as in the past, is the king of fruits; is this year above the average through the State, both in quantity and quality; its importance is more and more manifest, in a sanitary view, and as a food and luxury for the people. Far too great a proportion of the crop in every full bearing year is lost, which should be sold, used or evaporated. We, as a people, have yet much to learn in the economic handling of the apple crop; the relative value of varieties is now much as in the past.

Our most profitable Autumn apples are the Gravenstein and Fall Pippin.

The most valuable Winter varieties, Baldwin, R. I. Greening, Roxbury Russet, Hubbardston Nonsuch, Talman Sweet, Pound Sweet.

Our Summer apples are profitable only to a very limited extent; the Primate is the best Summer apple but the Red Astrachan most profitable.

We have several new seedlings claiming value, of which it is yet too early to speak. Any new apple must have most decided merit now to gain the attention of the American Pomological Society.

In pears the Bartlett heads the list as a valuable variety, followed in value by the Anjou, Seckel, Clapp's, Boussock, Onondaga, Dana's Hovey, Lawrence.

The peach crop is the most abundant in the annals of the State, and there is much encouragement to continue a judicious planting of this most delicious fruit. Our best list is, Oldmixon Free, Crawford's Late, Mt. Rose, Stump the World, Reeves' Favorite, Stevens' Rareripe, Crawford's Early, ranking in value in the order stated. There is too much loss in the very early peaches from rot, and of very late ones from frost.

Plums are very subject to curculio depredations and black-knot; the first can be controlled, the second in certain locali-

ties involves more difficulty. We need to have a good list of plums not subject to the black-knot. The Chickasaw varieties seem so far to be entirely exempt. Among our plums the Lombard and Shropshire Damson, would be most profitable only for their extreme tendency to be covered with black-knot. The German Prune, Smith's Orleans, Bradshaw, Pond's Seedling, Reine Claude and Bavay's, Coe's Golden Drop, and many others do admirably in skillful hands.

Apricots and Nectarines are not a success in common hands. A few choice varieties of the Russian apples we think worthy of trial, particularly the Gibb, Alexis, Catherine, Alexander, Nicholas and J. L. Budd; these give a succession and we think under the circumstances will be liked, though we do not wish to speak too confidently.

The cherry is a good fruit and should receive more attention, it should be canned a thousand times more than it is. A prime list of sweet cherries is Coe's Transparent, Black Tartarian, Gov. Wood, Downer's Late Red, and of sour cherries, Early Richmond, Montmorency, Ordinare, and large fruited Montmorency, with many other varieties doing nearly or quite as well.

The quince is for preserving or canning a most delicious and healthful fruit and succeeds well in proper soil and with proper cultivation. Orange, Champion, Pear and Meech's are the leading varieties.

Meech's Quince is promising, but in our latitude is somewhat liable to kill back in Winter, at least it has so troubled us; perhaps as the trees grow older they may stand better the effects of Winter.

The grape is a most important fruit, easy of culture, and quite valuable as a fruit, for the million. In a list for everybody to have we would mention the Concord, Worden, Brighton, Moore's Early, Martha, Pocklington, Hayes, Herbert, Rogers' 39. Delaware is excellent in good hands, Niagara where the conditions are all right, but it is subject to mildew and somewhat to Winter-killing, so is Empire State. Vergennes Winter-kills and mildews.

We are looking to the Ulster as one of much promise. Wilder, Merrimac, Prentiss, Salem, Agawam and Lindley all need sheltered arbors to guard against mildew and rot, while to cover an arbor or walk for shade, the Backus is unequalled.

The Pocklington and Martha are both as hardy and nearly as productive with us as the Concord.

SMALL FRUITS.

The strawberry heads the list, and is successful in good hands all over our State. For a light soil the Crescent, Chas. Downing and Sharpless are leading varieties. For a heavy soil and high culture the Jewel must head the list for productiveness, size and beauty; to this may be added, Belmont, Ontario, Lida, Gipsy and Sharpless. Perhaps the Crescent may bear more neglect than almost any variety, but the good cultivator will in no case tolerate any neglect. The Jewel makes plants sparingly, hence choose the most prolific plants for stock, and few persons will have cause to complain.

For currants the Fay, Versaillaise, Cherry and Red Dutch are the best varieties, and for white, the White Grape; but no white currant is received with favor by the general market.

Raspberries.—Our list for blacks is Springfield, Thornless, Souhegan, Gregg, Nemaha. For reds, Cuthbert, Reliance, Turner, Rancocus. Yellow, Golden Queen and Caroline, (and where protected) Brinckle's Orange.

Blackberries.—Snyder, Erie, Taylor; the Wilson, Kittatinny, Wilson Junior and Early Harvest winter-kill too frequently to be trusted in our latitude.

Mulberries.—The Downing and New American are both very productive and certain to ripen fruit for six successive

weeks; the Downing is better but less hardy.

GOOSEBERRIES.—Downing's and Smith's Improved are productive and hardy. The industry is large and productive and promises well.

In fruit, as a whole, the current year is of more than average productiveness.

FLORIDA.

Reported by Edmund H. Hart, of Federal Point, Chairman of the State Fruit Committee of Florida.

Since your last session, there is perhaps no State in which fruit culture has made greater progress than in Florida; and enigmatical as it may seem, this condition of things has been brought about, in a great measure, by a disaster that, at the time, threatened to wipe out entirely the most extensive and important of our industries, the growing of citrus fruits. On the 9th of January, 1886, there drove down upon us a cold wave from the ice fields of the Northwest, of such intensity as to wrap in a mantle of snow even the semitropic portions of the Union. The dwellers at Manatee, far down towards the extremity of our peninsula, where the like had not been seen before by any living person, were astonished at day-break to find the roofs of their houses whitened by this Arctic blanket. Grave apprehensions of the killing to the ground of all citrus trees were most fortunately not realized, for being in a dormant state from previous cold weather, the injury resulting was mostly confined to the partial loss of some of their tops, and at this period of writing they have nearly or quite recovered their former dimensions. Lemons and limes, which are more tender than the orange, suffered the most; in many cases being cut to the ground.

The succeeding crop of oranges was estimated by the most competent judges, as likely to reach seven hundred thousand boxes, but, to the surprise of all, about a million and a half were sent to market.

One notable effect of the freeze, however, is manifest, especially in the cooler portions of the State, in the increased attention paid to general farming, and the raising of fruits other than the orange. The Kelsey and other Japanese plums have been tried and found to succeed beyond our most sanguine expectations. The Kelsey, in particular, has exhibited astonishing vigor of growth, productiveness and size of fruit. Specimens from districts where the orange flourishes in perfection have attained proportions and coloring surpassing those grown in a more northern latitude, which indicates a special preference for, and an adaptability to a tropical climate, and places it in the same position with respect to plums that the Peen-to holds among peaches. It has already created a sensation.

The Le Conte pear grows and has fruited well in the heart of the orange country. The same may be said of the Peen-to and Honey peaches, and seedlings raised from them. Some of these are an improvement upon their parents and open up a prospect for the development of a sturdy and numerous race of tropical peaches.

Extensive orchards of the fruits above mentioned are being planted in all but the still undeveloped lower portions of the State. Many varieties of foreign and northern grapes are also being tried with increased prospects of success, and a very satisfactory beginning has been made in the manufacture of wine, which, it is thought by competent judges, can be produced as cheaply and of as good quality as in the famous wine growing districts of France, when our cultivators shall have attained the requisite experience and skill.

The Japan persimmon succeeds so admirably upon stocks of our native diospyros, which spring up abundantly everywhere, that some have been encouraged to plant extensive orchards of this delicious and attractive fruit. The most serious drawback to its cultivation arises from the ravages of birds upon the maturing crops.

From a small beginning the cultivation of strawberries has, in the last two or three years, expanded to such proportions as to outweigh in importance, in some communities, all other branches of horticulture. Hitherto it was not thought possible to ship them to Northern cities unless in refrigerators, but last Winter many shipments were made with satisfactory results simply by express or fast freight, without the use of ice, the only essential requisite aside from rapid transit being careful stowage and thorough ventilation in suitable cars. The Newnan, Hoffman and Crescent are preferred; but when not attacked by mildew, to which they are liable some years, the old Federal Point surpasses all in productiveness.

Of all branches of Pomology, however, the growing of citrus fruits must always take the lead in Florida. The testimony of impartial judges to their unsurpassed excellence, and to the preeminent congeniality of surrounding conditions is well nigh unanimous.

The shipping season may be expanded so as to extend over the whole year. Lemons are large enough to begin upon in July, the earliest oranges in September, and some of the late-ripening oranges, notably Hart's Tardiff may be left without injury upon the trees throughout the following summer. Experiments have demonstrated the practicability of keeping oranges and lemons many months in cold storage, without impairment of quality, and it is claimed that the same end may be achieved by the application of various anti-septic preparations.

In the present experimental condition of fruit culture here, it is as well, perhaps, not to attempt any recommendation of special varieties until further trials shall have enabled your correspondent to speak with confidence. In the Northwest counties where climatic and telluric conditions resemble those of Southern Alabama and Georgia, quite a large variety of apples and pears may be successfully grown. These, of course, would mostly be failures in Central and Southern Florida. It is suggested that by grafting upon stocks of the sturdy oriental pears, a fair measure of success may be achieved with some of the Northern pears and apples, even to the borders of the tropics.

GEORGIA.

Reported by Samuel H. Rumph, of Marshallville, Chairman of the State Fruit Committee of Georgia.

Fruit culture is still on the increase in this State. The apple and grape seems to take the lead in the northern portion of the State, the peach and plum in the middle, and the Le Conte pear holds sway in Southern Georgia. We have the largest crop of apples ever known here, and the orchards generally have a vigorous and healthy appearance.

Peaches the lightest crop for many years, in fact almost a total failure. They commenced blooming about February 15th and most of the varieties were in full bloom by March 1st. This being the natural time for blooming with us, every indication bespoke a fine crop, but on March 30th, when the leaves were half grown, and the young fruit was from one-fourth to one inch in diameter, we were visited by a severe frost, which destroyed the crop entirely, only in a few very favored localities. It is generally conceded that Houston and Macon counties shipped more peaches the present season than the remainder of the State combined, and there was not over one-tenth of a crop in those counties.

The greatest obstacles to successful peach culture here are late Spring frosts and the curculio.

We think the Elberta peach should be placed on the list of peaches in catalogue with (* *) two stars for Georgia, as there are more young trees being planted of this variety in the State than any other, and

it is one of the most profitable varieties we have.

The Le Conte pear crop was very fine in Southern Georgia this season, and there were thousands of bushels shipped at paying prices, but the crop was light in Middle Georgia, and an entire failure in the Northern portion of the State. Blight has been reported on the Le Conte to a limited extent from every section of the State this season.

INDIANA.

Reported by A. Furnas, of Danville, Chairman of the State Fruit Committee of Indiana.

It is pretty well known that the apple crop with us is practically a failure, never more so, and but once since we have had trees large enough to bear, have we come so near an entire failure.

With this condition of apple growing it seems to be difficult to obtain much information from other parts of the State.

Apples.—There has some sort of unaccountable change taken place, not only in the health and thrift of some varieties of trees, but also in the fruit itself. In my boyhood days I can well remember when the Yellow Bellflower was an enormous fruit, immense crops and of the finest quality. Now these have not been a good crop over the country in thirty years.

The Vandervere Pippin, was in almost every collection, and was very popular as a good cooking apple. But now it rots and falls prematurely, so much so that generally it is worthless. The rotting of this variety began in isolated localities while others near by appeared healthy. I noticed this in the demand for the tree. For instance, south of me the demand for this tree ceased some ten years before they gave it up north. Rawle's Janet was extensively disseminated in "early times." This tree is measurably healthy yet, but the fruit is much smaller and rots badly on the tree. About the first variety to fail was the White Winter Pearmain. This commenced specking or scabing a quarter of a century ago. The old Golden-russet or Bullock's Pippin, used to be my ideal of excellence, but now the tree is exceedingly tender, and it is a rare thing to find a smooth specimen of fruit. Later on the Ben Davis promised better and we all planted Ben Davis. The first results were very satisfactory, bearing early and heavy crops. But this too has proved tender and is falling into disfavor. The White Pippin had a temporary run but was found to not bear well. One old variety stays with us, that is the Winesap, which I now think is in better condition than formerly.

Taking them nearly in the order of their ripening we have Red Astrachan, not productive but seems to be hardy. Maiden's Blush, though not very hardy still holds its deserved popularity. Grimes' Golden Pippin promises to be a good thing. Indiana Favorite promises well, seems hardy and the quality is desirable. Ross' Nonpareil is hardy, productive and desirable, but would be better if it was a better keeper. Duchess of Oldenburg seems entirely at home with us, healthy good grower, bears early and freely, large and showy, and if not good, beats nothing a long way. Talman Sweet is the hardiest tree with us, but certainly not as good in quality as we were led to expect from the praise it gets from the Eastern States.

The Jarminite tree is very healthy, resembling the American Pippin, though in quality of fruit much superior, being a long keeper and generally gives complete satisfaction.

Pears.—The pear crop this year is much better in proportion to the apple crop than might be expected. The crop might be put at from one-fourth to one-half crop. Few, however, have many trees, as the severe Winters, blight, and leaf blight, and other causes not easily explained, have taken almost all of our trees. Bartlett has

been more extensively planted than any other variety. In early times standard Bartletts did well, yielding successive heavy crops, but now but a few crops at most are to be expected, and the trees die. The same might as well be said of Flemish beauty. Le Conte is tender and Keiffer has not proved satisfactory.

Peaches.—Where there are trees there is fruit this season, for the first in four or five years. A peach is a peach with us. I am writing in Central Indiana, and this remark applies to us and North of us, but does not in the South, among the hills, where trees are set by the thousand for market. The South part of this State has the honor of originating the famous Fleenor.

Plums.—These fruits were of little value until the Wild Goose was introduced—which in most cases has been a success. The Miner gives us an occasional late crop. Just now the Robinson is all the go. It is only another variety of Chickasaw, but for crops, and early bearing, I never saw its equal. Ten days or two weeks later than Wild Goose, and smaller but quality the same.

Cherries.—Outside of the Early Richmond and English Morello, nothing has been extensively introduced that was worth anything.

Strawberries are at home on our soil. The most popular here are Crescent, Cumberland, Green Prolific, and on new, rich and damp soils the old Wilson's Albany, especially for market.

Raspberries.—These always succeed well if the season is not too dry; especially is this true of the Black Cap. From what I can learn our markets deal less in the red varieties than any other. You may take a walk through our markets and never see a red berry. Mammoth Cluster and Gregg are the principal varieties, though I predict a good demand for Shaffer's Colossal.

Currants and gooseberries are rendered almost worthless by the depredations of the currant worm.

Obstacles to Fruit Culture.—These, with the apple, are sudden freezing of the sap with the first frosts. The same with the pear, causing blight, with the peach the intense cold of our changeable Winters.

Grapes have for many years rotted badly until this year. This was supposed to be on account of the unprecedented drouth. Concord, Delaware, Ives, Worden, Clinton and many other varieties have done well.

IOWA

Reported by G. B. Brackett, of Denmark, Chairman of the State Fruit Committee of Iowa.

I regret that I cannot give a more cheerful report on the Horticultural outlook of this part of the country. Since my last report two years of the severest drouth ever known since the settlement of the State have added greatly to the test conditions of our climate and very materially to the discouragement of the growing of orchard fruits. In the Northern part of the State almost everything less hardy than Oldenburg, Tetofsky and Fameuse, have been swept away.

The effect has been to dampen the ardor and enthusiasm of the most zealous fruit-growers and to turn more than ever their attention to the work of obtaining more hardy varieties.

Some are looking to the importation of apples from Russia, with the expectation of finding something that will withstand our climate, while others are expecting more satisfactory results from crossing our best varieties with these hardy sorts from Russia.

Now with these two classes of experimenters in the field, there is no doubt but what a great change will be effected in the orchard fruit adapted to this great Northwest.

The reports from different parts of the State as to the behavior of these Russian apples are quite conflicting. R. P. Speer

from the North writes: "Of the Russian apples which I have tried longest, the Silkenleaf (a cooking apple) is most valuable. The Noble Redstreak, is very promising. I believe from four years experience with 130 varieties of the Russian apples, that many of them will prove valuable in the north half of Iowa."

From Central Iowa Mr. C. L. Watrous writes: "For the last six years I have been trying to find among the importations from Russia something to meet our wants. I have planted for trial more than 300 varieties of the apple, some twenty-five or more of the pear, and as many of the cherry, all the plums I could get, with trees and shrubs too numerous to mention. Of the apple trees a few have fruited, and with a single exception the fruit has been of the lowest quality; thin, sour and poor, with too often a twist of bitterness simply atrocious. As to hardiness, and healthfulness these 300 trees have not averaged as well as the common old varieties. It is the opinion of my foreman, in which I concur, that at least four-fifths of these have shown such signs of inferiority as to stamp them worthless here. Of all the pears only one has proved sound and healthy. This has not fruited. Of the cherries, many have suffered from Winter injury. The Russian Apricot has fruited. The men in the nursery characterized the fruit as "sweetened Wool," so insipid and fibrous was it. The Mulberry has fruited abundantly and is utterly unfit for use."

Notwithstanding the uncertainty about these foreigners, thousands are planting them before they have been tried sufficiently to sort out the valuable varieties from the worthless, and great will be their disappointment when they come into bearing. Few, if any of them that have fruited have proved to be long keepers, and the quality of the fruit is generally found to be far below our old sorts. It has taken forty years to find out that many of our old varieties would not stand the test of our trying climate, and how can we decide upon the merits of these new comers in the short time they have been among us.

The statement which I make in my last report in reference to the Southwestern part of this State is verified by further investigation.

Many nurserymen are now turning their attention to rendering these old sorts more hardy by top-working them on to hardy stocks, and one of the best stocks for this purpose is found in what is called the Virginia Crab (not Hewes), which is perfectly hardy and blight proof.

There is a growing interest in the production of seedling fruits, and to encourage this new enterprise our State Horticultural Society is offering very liberal premiums for such fruit as shall come up to a certain standard of perfection, as prescribed by rules and regulations which have carefully been prepared and published in the annual reports of the Society.

Of the varieties of apples grown in the Western and Southwestern part of the State the Oldenburg, Wealthy, Famense, Fall Wine, Roman Stem, Wine Sap, Janet and Grimes' Golden, are the favorites. Others less hardy, such as Maiden's Blush, Benoni, Lowell, Wagener and Ben Davis, are still grown and are profitable, as they bear young and are prolific. The Ben Davis will continue to be grown as a market apple until something better is found to take its place.

Native plums are grown more than any thing else, being less liable to the attacks of the curculio and more hardy than the European varieties. The De Soto, Wolf, Rolling Stone, Forest Garden and Wild Goose are considered the best.

Of grapes the Worden heads the list for productiveness and profit, though not so well known or so extensively grown as the Concord. The Lady, Moore's Early, Elvira, Pocklington and Woodruff's Red are gaining in favor as they become better known.

Of raspberries the Turner, Gregg, Tyler, Shaffer and some others are extensively and profitably grown.

The list of strawberries that do well all over the State is a long one, but the Crescent still leads for productiveness and profit.

KANSAS.

Reported by G. C. Brackett, Lawrence, Chairman of State Fruit Committee of Kansas.

This State has had ten consecutive years of abundant fruit crops, preceding that of 1886, which was an exceptional one and rather light, and yet during that year the crop was not a failure, as the following statistics compiled from reports received at the Secretary's office of the State Horticultural Society show (100 representing a full crop.)

Apples	58	per cent.
Cherries	59	" "
Pears	40	" "
Plums	60	" "
Grapes	78	" "
Blackberries	76	" "
Currants	59	" "
Gooseberries	82	" "
Raspberries	77	" "
Strawberries	68	" "

The present year's crop will be a partial failure, as shown by the following crop report, made up on August 1st.

Apple	46	per cent.
Cherry	37	" "
Pear	43	" "
Plum	43	" "
Grape	81	" "
Blackberry	53	" "
Currant	22	" "
Gooseberry	34	" "
Raspberry	54	" "
Strawberry	44	" "

Of varieties of apples, the Early Harvest, Carolina June, Cooper's Early White, Chenango, Maiden's Blush, Lowell, Jonathan, Winesap, Ben Davis, Smith's Cider, Rawle's Genet, Missouri Pippin, still lead as the most profitable sorts, and are very productive. The York Imperial is rapidly gaining favor as a commercial variety, the tree having been proved hardy and productive.

The Early Richmond cherry constitutes the main planting and crop; among pears the Bartlett, Howell, Anjou, Seckel and Lawrence are safe to plant; among plums the Wild Goose leads; Kittatinny, Snyder and Taylor are our most valuable blackberries.

Currants.—Red and White Dutch, White Grape, and for the western counties a native black variety, which is very hardy and vigorous, and produces a heavy crop of very large berries.

Gooseberries.—Pale Red and Houghton, and for the irrigated districts in the western portion of the State, the old English varieties seem to thrive.

Raspberries.—For first early the Souhegan is hardy and immensely productive, followed in season by McCormick, Gregg and Shaffer. The last proves one of the most hardy both in Winter and Summer and very productive.

Strawberries.—Crescent, Chas. Downing, Miner and Atlantic are satisfactory sorts. The main requisite to success here, as in other States, is in a deep and thorough tillage of the land before planting, and frequent cultivation during the growing season.

The present year's grape crop is quite heavy. The Concord has been mainly planted and is the most reliable, although other old varieties succeed in special locations. Many of the newer sorts are proving successful in the Arkansas river valley, and other locations where sand forms a large part of the soil. Such as the Pocklington, Niagara, Morris' Early, Lady, Elvira, Lady Washington, Duchess, Salem, Highland, Black Defiance, Jefferson, Victor, etc.

New Varieties.—The Cullen, an apple which resembles the White Pearmain, but is of much better quality, a very late keeper, and exempt from that almost fatal disease the "Scab."

A new peach, origin Montgomery

county, and undoubtedly of the Alexander strain, but much larger and more productive than that variety and ten days earlier than the Amsden.

A raspberry called the Lotta, a uniformly very large, glossy black berry, much larger than the Gregg, fine form, very sweet, flesh firm and juicy, a fine shipper. Plant a very strong grower, healthy, and endured the extreme cold of the Winter of 1886 and '7, without injury even to the tip end of the canes.

MINNESOTA.

Reported by S. D. Hillman, of Minneapolis, Chairman of State Fruit Committee of Minnesota.

The American Pomological Society has done and is doing a grand work for the promotion of American Pomology. It is perhaps, unnecessary to say that its influence has been felt to a marked decree in the "North Star" State.

Our report must necessarily be somewhat brief. The fruit crop in Minnesota the past season has been unusually light; several causes have contributed to this result, among them being late frosts, drouth and insect depredations. The drouth, while perhaps not nearly so protracted or severe as in several other Western States, was quite damaging in its effects upon small fruit products. Grapes are a good crop and remarkably fine.

Last year the season as a whole was a fruitful one. Apple orchards produced an abundant crop of fruit. Native plums were remarkably abundant also, while for the present season the crop is nearly a total failure.

In the variable and peculiar climate of Minnesota, much persevering effort is required on the part of Pomologists in order to attain the best results in the production of choice varieties of fruit. We have here a goodly number of intelligent, earnest and enthusiastic fruit-growers, who, for several years past, have been carefully experimenting and pursuing a line of patient investigation and research in order to develop and advance this good work. The necessity of this pains-taking effort is each year more and more apparent. Quite liberal appropriations are made from time to time by the Legislature to aid the cause in various ways. Experiment Stations have been established in different localities in the State and the work begun and being carried forward is accomplishing good results.

The Minnesota State Horticultural Society, which is now of age, having been organized twenty-one years ago, has done much for the cause of pomology, not only in the State but throughout the entire Northwest. Its meetings are well attended; the discussions at its annual gatherings are usually animated and of an interesting nature. The number of local or county organizations is on the increase, and these are doing efficient work.

So far as Minnesota seedling apples are concerned there are no varieties as yet that meet with popular acceptance and favor like that accorded to our well-known Wealthy. It may be questioned whether we shall soon produce a larger seedling winter fruit, possessing greater merits, when hardiness of tree, fine quality of fruit and beauty of appearance are considered. True it is there are some promising candidates for public favor, but time will be required to fully test their merits.

Peerless originated in Rice county, a seedling of Oldenburg, appears to be a promising variety. The tree has borne some ten or twelve crops of fruit and has proved to be hardy and productive.

Oakabena, originated in Nobles county, is also promising. The tree has a diameter of seven and one-half inches a foot above the ground; top round, symmetrical, well balanced, of strong and healthy growth; fruit medium size, fine form, yellow, shaded and striped with red; flesh crisp and juicy; quality as good or better

than Wealthy. The tree has borne five crops of fruit. How well it may succeed on other soil, with different surroundings, is yet to be determined.

In this connection we may add, in the language of Prof. J. L. Budd, of Iowa, that "an apple that will endure our test Winters well must maintain perfect foliage during our hot, changeable Summers and must be as determined in habit of ripening its wood as the Box Elder or Hickory; it must have a bark that will absorb water readily in wet times in Autumn or early Winter; it must hibernate in Winter and have a cell structure practically incapable of freezing."

There can be little doubt that Russian apples, especially the newer sorts, are gaining steadily in favor among our leading orchardists. Our experience here accords entirely with that of the distinguished Horticulturist of Vermont, Dr. T. H. Hoskins, who says: "These apples are, as a class, very much hardier against adverse climatic influences and especially against Winter's cold, than those previously grown on this continent."

Russian fruits, where given a fair trial, are succeeding finely, producing large and showy crops of fruit. Mr. Andrew Peterson, Waconia, reports for last season: "Hibernal, Ostrokoff's Glass, Charlamoff and Winter Lowland, as usual bore a heavy crop of fruit; Christmas and Red Cheeked did not bear so much."

Mr. Chas. Luedloff, of Carver County, has some fine specimens of fruit this season. He reports the varieties that withstood the test of Winter best were: Russian Green, Ostrokoff's Glass, Lieby, Kurski, Smelling apple, Round Wassen, Arcade, Switzer, Charlamoff, Beel, St. Peter, Milton, Red Lake, Lake Winter.

Mr. A. W. Sias, at Rochester, has numerous varieties and reports the six best: Autumn Streaked, Russian Green, Juicy Streaked, Green Transparent, Red Cheeked, White Russet.

Mr. Wm. Somerville, of Olmsted County, has some forty-five varieties of new Russians and is enthusiastic as to his success with them thus far. One unknown variety, very productive, large and showy, took the blue ribbon at the State fair last year.

It is estimated there has been over $200,000 worth of all kinds of nursery stock disposed of in our State the past year, fully one-half unfitted for this climate. This money parted with for trash, worse than thrown away, gives cause for discouragement to many new beginners in fruit-growing and home adornment.

In accordance with action taken at the annual meeting of the State Horticultural Society, a bill was drafted and passed by the Legislature for the purpose of preventing fraud in the sale of nursery stock. This law appears to give very general satisfaction. It may not be the best means for accomplishing the end had in view, but is certainly worthy of a fair trial.

First—Species of fruit grown successfully, viz.: Apple (*Pyrus Malus*), Siberian Crab (*Pyrus baccata*), American Crab (*Pyrus coronaria*).

Plum—(*Prunus Americana*) Wild Red and Yellow.

Cherry—(*P. Pennsylvanica*) Wild Red Cherry, (*P. serotina*) Wild Black, (*P. Virginiana*) Choke Cherry, (*P. cerasus*), Red Garden Cherry.

Grape—(*Vitis Labrusca*, *V. æstivalis*, *V. cordifolia*).

Strawberries—(*Fragaria Chilensis*, *F. vesca*, *F. Virginiana*).

Rubus—(*Strigosus*) Wild Red Raspberry.

Rubus—(*Idæus*) Garden Raspberry.

Rubus—(*occidentalis*) Black Raspberry.

Rubus—(*odoratus*) Purple Flowering Raspberry.

Rubus—(*villosus* and *Canadensis*).

Ribes—(*rubrum*) Red Currant.

Ribes—(*Floridum*) Wild Black.

Ribes—(*nigrum*) Garden Black.

Vaccinium—Cranberry, Blueberry.

Amelanchier—Juneberry, Serviceberry.

Amelanchier—Canadensis, Shadbush.

SECOND—Varieties best adapted to Minnesota soil and climate: **Oldenburg. **Wealthy. *Autumn Streaked. *White Russet. *McMahan White. *Hibernal. *Red Checked. *Red Anis. *Russian Green. †Antonovka. *Titovka. *Soiree. *Synonym. *Giant Swaar. †White Pigeon. †White Transparent. †Green Transparent. †Koursk's Anis. †Brett No. 1. †Brett No. 2. †Brett No. 3. †Okabena. †Houston. †Plikanoff Small. †Rosy Little Turnip apple. †Lieby.

SIBERIAN CRAB OR HYBRIDS.—**Whitney No. 20. **Early Strawberry. **Beacher Sweet. **Florence. **Power's Large Red Siberian. **Orange Crab. *Martha. *Sweet Russet. *Gideon No. 6. *Byer's Sweet. *Orion. *Virginia. †Dartt's Hybrid. †Sylvan Sweet.

PLUMS.—**De Soto. **Harrison's Peach. **Weaver. **Forest Garden. **Rollingstone. **Syn. Minnesota. **Wild Rose. *Rockford. *Cheney. *La Duc.

CHERRY.—*Osthem. *Wild Black. *Wild Red. *Chokeberry.

GRAPES—**Worden. **Moore's Early. ** Concord. ** Delaware. * Brighton. *Rogers' No. 39. *Lady. *Janesville.

STRAWBERRIES. — **Crescent Seedling. **Downer's Prolific. **Manchester. **Old Iron Clad. **Hart's Minnesota. *Wilson's Albany. †Jessie.

RASPBERRIES. — **Red. **Brandywine. **Turner. *Cuthbert. **Black Caps. **Ohio. *Gregg. *Doolittle.

BLACKBERRIES—**Ancient Briton. **Snyder. *Stone's Hardy. †Thornless.

DEWBERRIES.—**Cook's Hardy. *Lucretia. †Mammoth.

CURRANTS.—**Red Dutch. **White Grape. **Victoria. **Long Bunch Holland. **White Dutch.

MISSISSIPPI.

Reported by W. H. Cassell, of Canton, Chairman of the State Fruit Committee.

As fruit growing for commercial purposes is largely on the increase and likely soon to be a leading industry in this State, I shall vary this report somewhat from those previously sent by giving it a trend in that direction, yet endeavoring to keep within the purview of the rules. The varieties grown are, for the most part, those which have been well tested, and known to succeed best, and hence the number is comparatively small. The orchards for general purposes embrace a greater number of varieties and call for a few changes in the catalogue.

After enumerating the suggestion of changes for the catalogue, Mr. Cassell says:

Sucker State, among strawberries, has been tried for two or three seasons with uniformly good results, and is by some preferred to Wilson as a market berry. Another season will probably give this and the Finch * *. Sharpless is very large, of excellent quality and fine for family or near market. Our growers have been afraid of Crescent, thinking it would not carry to Northern markets, but the past two seasons have demonstrated its success in this particular, and its heavy crops have made it highly remunerative to those who have tried it, so that it is now being planted extensively. The season just past has been a profitable one to strawberry growers generally; and, from the inquiry now for plants, we judge there will be a large increase in the acreage planted the coming season.

Raspberries are being grown to a limited extent for market, Turner and American Black being the principal varieties. Gregg, Ohio, Marlboro and Cuthbert are also planted to some extent. Ohio and Marlboro should have †. This crop is not considered so safe nor so profitable as the strawberry.

Blackberries are so abundant in the woods that only a few of the improved kinds are cultivated—none for market. I tried Lawton years since, but it rusted badly and I gave it up. Kittatinny has borne several crops, is of fine size, excellent quality, and a profuse bearer. Wil-

son Junior on trial—will fruit next year.

Dewberries (wild) bear large crops and fine berries, in the alluvial soil in the Mississippi river bottoms, and tolerable crops elsewhere, ripening with the raspberries. Of the cultivated kinds Lucretia, Mammoth and Bartle, bore heavy crops this season and may be said to promise well.

Grapes are being planted for family use and to some extent for market; the varieties for market being chiefly Concord, Ives, Moore's Early and Delaware. The Scuppernong and varieties are being planted for family use and for wine. A small but interesting experiment in tile draining has been tried here by Dr. N. C. Orrick. He constructed an arbor nine feet wide and planted on either side, nine feet distant, in well prepared borders, the following varieties: Wilder, Elvira, Niagara, Triumph, Goethe, Delaware, Cynthiana, Peter Wylie, Lady, Martha, Maxatawney, Agawam, Herbemont, Mo. Riesling, Montgomery and Pearl. Soil a mulatto clay. Before draining the growth of the vine was not satisfactory, and the fruit rotted largely. Since draining the vines have grown better, are more healthy and the fruit does not rot.

Considerable attention is being paid in certain localities to the planting of pecan orchards, several parties having from 100 to 1,000 trees planted. In most cases the site for these is low and flat, and generally too wet for fruit trees of most kinds. I have seen pecans of excellent quality grown in this State.

For market, however, the strawberry among the smaller, and the peach among the larger fruits, are being grown in much the greatest quantities. In peaches, Yellow St. John, Foster and the Crawford's —high-colored, yellow-fleshed varieties— are most largely grown; then Tillotson, Mountain Rose, Thurber, Stump the World and Oldmixon Free, with a good share of Picquett's Late, Salway and Smock in smaller quantities, about complete the list of profitable market varieties. Some grow Early River's, and many have Alexander and Amsden already planted several years since, but there is a general "turning away" from anything earlier than Tillotson or St. John, as not sufficiently reliable.

In apples, for profit, few will venture beyond Astrachan, Early Harvest and Carolina June.

Few pears of any kind except Bartlett, and not many of these, had for some time been planted for market, until the introduction of the so-called blight-proof varieties Le Conte and Kieffer. Under the positive assurance that these were blight-proof, the Le Conte absolutely so, a new impulse was given to the planting of pears, especially of these two varieties, which were said to bear early and profusely, and the fruit of fair quality; until there are to-day probably more than 250,000 trees planted in the State, much the larger proportion being of the Le Conte; and the planting continues. This season, however, has shown some blight on the Kieffer and also on the Le Conte. Absolute immunity from blight, in the latter, was promised by the nurseries of Thomasville, Ga., provided the trees were on their own roots, that is, grown from cuttings in a direct line from the original tree, and having none of the blood of the European stock in them. But these "pedigree" trees have shown some blight this season, as also the grafted Le Contes, yet this has been to a very limited extent, even when grown near Bartletts that were blighting badly.

Plums come next in value, the Wild Goose proving profitable in many instances but failing in others. The Mariana, from its success in Texas and elsewhere South, is being planted to a considerable extent. Kelsey's Japan, which has fruited the past two seasons, gives promise of being a great acquisition, and there is considerable demand for trees of this variety to plant the coming season. It is certainly of very fine quality, and of

large size, and also a handsome fruit. The "Gage" family of plums, *Prunus domestica*, are of little value to us, giving only partial crops in the Northern portion of the State.

The fig has been shipped in some instances to the Northern markets, but the results have not been sufficiently remunerative to induce extensive planting. This fruit has possibilities which must in time command attention by growers south of the 33d parallel, where it can be grown without protection.

JAPANESE PERSIMMON.—This fruit has been planted for market by one party near Crystal Springs, who has several hundred trees about four years in orchard. I saw them a few days since, and many were bending under a heavy crop of these large fruits which were just beginning to color. Its commercial value remains to be tested.

PACKAGES.—For strawberries, quart boxes in six gallon crates are generally used, and sometimes pint boxes early in the season; for raspberries, pint boxes; for apples and pears, barrels and third bushel boxes; for peaches, third bushel boxes. This season a new package was used to some extent for the finer specimens, and with fair satisfaction. It consisted of a half bushel crate containing four oval flat baskets holding one gallon each, and furnished with wire handles that drop in packing. It is claimed that the finer specimens sold better in this package than in the third bushel box.

Plums are shipped in third bushel boxes and strawberry crates.

Statistics are difficult to obtain. The largest shipping points for fruits in this State, are Madison, Terry and Crystal Springs on the I. C. R. R. The last named place reports 4,000 crates of strawberries, and 20,000 boxes of peaches this season.

The heaviest shipments from this point are in vegetables, of which from three to five car loads of tomatoes alone were shipped daily during the height of the season. Terry generally sends a good many more peaches than Crystal Springs, nearly twice as many. Owing to the late spring frosts there was not a full crop at either place, and north of these nearly all the peaches were destroyed except in a few forward localities. Apples, pears and plums shared the same fate. Madison shipped about 5,000 crates of strawberries, with light shipments of other fruits also.

MONTANA.

Reported by J. D. McCamman, of Bozeman, Chairman Territorial Fruit Committee of Montana.

After enumerating suggestions for the compiler of the fruit catalogue, the report answers questions sent out by the general chairman as follows:

NEW NATIVE VARIETIES.—We have raised several new varieties of apples from seed, not named. Some of these are very valuable and others are promising.

OBSTACLES.—The chief obstacles we encounter are mice, moles and rabbits; these vermin sometimes destroy the growth of years.

CULTURE AND PRUNING.—We prefer top-dressing and frequent stirring of the soil with the plow—and the system of pruning pursued by us with best results is to preserve low branches.

STORING AND KEEPING WINTER FRUITS.—As yet no regular system of storing such fruits has been required, as fruits raised in this county fine a ready market within the Territory before the season has fairly closed. We have found no difficulty in keeping late apples throughout the Winter in common cellars or root houses.

PACKAGES.—We ship apples and other large fruit in common forty pound boxes, without loss, while berries arrive at our markets in good condition packed in Eastern crates made to hold two dozen quart boxes.

STATISTICS.—I cannot now give the amount of land devoted to fruit culture,

or the number of trees planted. There are at least thirty bearing and profitable orchards now in this county—and in two or three years there will be many more, as every farmer who can afford to do so, is purchasing and setting out trees from year to year. This is especially the case in the Bitter Root valley, which is the principal fruit producing district in the county. Eastern nurserymen have taken thousands of dollars out of this valley in the last few years in exchange for young trees.

In our own orchard (W. E. Boss & Bro.) at Pine Grove Farm, in this valley, we have now standing about 3,000 healthy apple trees, of which 1,500 are in full bearing and have 3,000 more as yet mere striplings—and will continue to set out from year to year. We have 100 pear trees (ten in bearing); fifty plum trees in bearing and twenty-five cherry trees all in bearing. Of grape vines we have twenty producing fruit. This orchard was commenced as the "pioneer" fourteen years ago, and we ship now as much as 1,000 (40 lb.) boxes of apples per season. Of the various kinds of small fruit we cultivate three acres, and have marketed annually 2,000 boxes. Ours is of course the largest fruit producing farm in the county, but it will not be many years before every farmer has his own orchard, either great or small.

Raising Strawberries for Profit in Montana.

BY M. WISNER.

The climate of Montana is eminently favorable to the production of strawberries and the methods and systems in use elsewhere, will probably succeed here, the only difference being more water is required than in the States where rain is more abundant. I prepare the ground with special reference to that fact. Supposing the plowing and harrowing has been well done, with a single or double shovel plow run furrow, four feet apart, following the uneveness of the ground in such a way as to give a uniform grade or fall to the furrows, which should be barely enough to cause the water run. This can best be done by using for every fourth furrow, a device in common use, called a triangle, the intermediate rows conforming to the triangled row near enough for practical purposes. Ground thus prepared, even on steep and rough hill sides, can be irrigated without washing away the plants. Now set the plants eighteen inches apart in the edge of the furrow on the lower side, scoop out a place with the hand, spread the roots fairly well, cover with two inches of soil, and press firmly, even to striking a smart blow with the fist or stepping on them. Now turn on water and give them a good soaking, and as often as once a week irrigate—soak the ground full. I use the matted row system, hence do not undertake to keep runners off, but keep the weeds out the first season. By fall there will be an increase of at least ten to one. I have had as high as fifty to one from the Crescent. Spring is the best time to plant, the cool weather and occasional showers bring them on rapidly. The second year will give the best crop, after which they will deteriorate, and I would advise replanting, although at the present writing my third crop looks like a field of buckwheat in bloom, so plentiful are the blossoms, but the berries are sure to be undersized.

The Crescent is the best berry I have found out of twelve leading varieties. The Crescent is deficient in pollen and requires some fertile berry to mix with it. I use Jucunda about one to five, or one row in five, if preferred. In gathering I endeavor to pick over the field once in three days during the height of the season, picking all that are fairly red. Soon as a field has been gone over turn on the water and soak the ground full. The more water the more berries, and larger. In gathering, great care should be taken to keep the berries in the shade.

I use full quart boxes, square, with a rim on the bottom to protect the lower tier and insure ventilation. Use sixteen box crate; they cost when made and filled with boxes thirty-five cents per crate. One half of this is freight from St. Paul, Minn., to Bozeman. The price obtained for strawberries heretofore has been very satisfactory, have been in good demand at from fifteen cents to twenty-five cents per quart. The market being very limited, however, it is not likely if many should raise them to sell, that more than seven cents could be obtained for them.

During the fruiting season have the surface constantly damp and dark colored with the moisture that comes from beneath.

Water Them! WATER THEM!! WATER THEM!!!

NEW HAMPSHIRE.

Reported by James M. Hayes, of Dover, Chairman of State Fruit Committee.

There has been but little new to report to the Society from our State within the two years past. Not but what gradual improvement in fruit growing is perceptible. Perhaps, however, the pear does not succeed as well as formerly. Many varieties that a few years ago were thought of much value, are now worthless from cracking. The Anjou, as I reported in 1885, is gaining in favor from year to year and bids fair in a short time to occupy the same place with pears that Baldwin does with apples.

Of new varieties, the Shaw apple, originating with C. C. Shaw, of Milford, N. H., was exhibited at the Boston meeting of the present month. It is a medium-sized apple, having somewhat the appearance of the Gravenstein and ripening the same time. It is thought it may prove valuable. The Russian apricot has been widely disseminated here, and has proved quite hardy; it has not fruited as yet, so I cannot, from experience, speak of the quality of the fruit. I have no changes to suggest in the fruit catalogue at present; there are some varieties of fruit that do not succeed here, that in other parts of the State thrive admirably.

Among insects the canker worm appeared to be on the increase two years ago, but the present season it has been scarcely noticed. The severe Winters, or some other cause, has stopped its depredations.

The pear trees are many of them affected with some kind of a leaf blight, so that they are denuded of their foliage in midsummer.

In bringing this very short and imperfect report to a close, it might be well to allude to the encouragement to our orchardists to continue in the business, from the fact that there is much better demand for their products since the exportation commenced to Europe. With this increasing from year to year, and with new markets at home, our orchards will be as remunerative as any other branch of agriculture.

NEW JERSEY.

Reported by Andrew S. Fuller, Chairman of State Fruit Committee of New Jersey.

I have very little to add to my former reports. Among the hundreds of new varieties of fruit brought forward annually and often highly extolled by their producers and those engaged in selling the plants, scarcely one per cent. remain in favor long enough to be admitted into the catalogue of this Society.

The old adage that "a new broom sweeps clean," is applicable to the new fruits of the country. It is certainly true that we are making some progress, but it is only in a few of the formerly long neglected genera, such as the raspberry, blackberry, strawberry and grape, and within about three decades we have reached a point, beyond which our further advance

is likely to be slow, unless we devise or discover some system of cultivation at present unknown.

New Jersey can probably safely boast of possessing as great a variety of soil, climate, exposure, together with as many different species of noxious insects and diseases as any State in the Union. Still, with all these favorable and unfavorable conditions and enemies the fruit growers do, somehow, manage to raise considerable fruit for market.

The southern part of the State gave promise, a few years ago, of becoming a fruit growers paradise, but insects and diseases have somewhat paralyzed both the enthusiasm and efforts of the fruit growers of South Jersey, and in seeking information for this report I have received some notes from Mr. Alex. W. Pearson, of Vineland, a man whose knowledge and long experience entitles his word to great weight in this matter, and for this reason his notes are given almost entire, and as a fair representation of the condition of pomological affairs in the Southern half of this State.

FIRST—SPECIES OF FRUIT.

All species of fruit suited to the temperate zone are grown in Vineland.

SECOND—VARIETIES OF FRUITS.

APPLES.—Early summer apples succeed best and are most profitable. Fall and Winter apples, though the trees grow well and are considerably planted, mature the fruit too early. It will not keep well in Winter. The Red Astrachan is probably the most desirable apple to grow here. It sells best in market.

PEARS.—The Bartlett is most grown, as it is a reliable bearer, always sells. Sheldon and Lawrence threaten to be failures, as they are afflicted with fungi, attacking both the leaves and the fruit. Anjou grows vigorously, but is late coming into bearing—trees eighteen to twenty years old just beginning to fruit.

The Kieffer pear succeeds especially well here. Its fruit is of better quality than when grown farther North. We consider it as good as the Bartlett for the table, and better than any other sort for preserving and for canning. It is hardy—an early and full bearer, and, as I have marketed it, sells better than any other variety. For example, in the Autumn of 1886 I sent very fine Anjous to Philadelphia and they sold for fifty cents per bushel. Late in October I sent Kieffers there which sold for three dollars per bushel. After growing fruit, for market, for twenty years, I would, in orchard planting, set almost exclusively the Astrachan apple and the Bartlett and Kieffer pears, principally the Kieffer.

PEACHES.—Of the old standard sorts all do well, and only need care and plenty of manure to be made profitable. Peach culture has not been profitable to growers here, but it is the fault of the man rather than the tree.

PLUMS AND CHERRIES—Grow thriftily and bear abundantly, but the fruit is liable to damages by insects and by rot.

GRAPES.—All varieties of the grape grow very thriftily and fruit abundantly, but the foliage is late in the summer, destroyed by the mildew, and the fruit is ruined by the black rot. Grape culture may be called a failure in this region on account of these "grape diseases." The Concord grape fails almost totally every year to mature its fruit. Vines looking splendidly in June are stripped of foliage and fruit by mildew and rot in September. The Ives seedling has been until the summer of 1887 tolerably healthy. This year it rots nearly as badly as the Concord. The grape known here as the "Ironclad" has hitherto been apparently fungus proof.

Third—There are no new native varieties which are attracting special attention in this region.

Fifth—The obstacles to successful fruit culture are insects and fungi. The cod-

ling moth, the curculio, the rose bug, the root borers, the slugs, worms and caterpillars which infest all fruits, and which are yearly becoming more numerous and destructive. Apple and pear tree blights, blackberry cane blight, raspberry cane blight—fungi attacking the plant and leaf, strawberry leaf rust, etc., etc., and fungi parasitic on the fruit. Each plant has its especial enemy, and each fruit also.

The culture of the red raspberry is nearly abandoned, owing to the blight, *Phoma lethalis*, which destroys the fruiting cane. A new cane blight, not yet identified or named, has destroyed three-fourths of the plantations of the Wilson blackberry in 1887. There is no disease of the fruits, either of raspberry or blackberry, or strawberry; only of the plants. On the other hand there seems to be no serious disease of the plant—in the grape—but ruin of foliage and fruit. In tree fruits, both plant and product are liable to disease. The former blights, the latter is prone to rot.

Various remedies for these various evils have been tried, with but little success.

There is also an increasing tendency to opinion that the peculiar prevalence of fungus diseases of plants, in this region, is due to deficiencies in the soil of certain elements of plant growth. It is hoped that when those elements, particularly lime and potash, are supplied, the health of fruit plants will be better conserved. A. W. Pearson.

NEVADA.

Reported by B. F. Leete, of Reno, Chairman of the State Fruit Committee of Nevada.

Pursuant to the following call:

NATIONAL POMOLOGICAL SOCIETY.

There will be a meeting of the State Committee of the National Pomological Society at my office in Block A, North Virginia street, Reno, Saturday, August 27th, at 12 M.

A full attendance of the committee is earnestly desired.

The business of the committee will be to report to the National Society, to be convened in Boston in September, the varieties, so far as known, of apples, cherries, grapes, peaches, pears, plums, strawberries, and other berries and fruits best adapted to the latitude, altitude, soil and climatic surroundings of our State, together with such other matters, touching the pomological interests of our State, as may be presented for consideration.

B. F. Leete,
Chairman Committee of Nevada.

Of our committee, composed of Messrs. R. P. M. Kelley, nurseryman, Reno; W. W. Morton, orchardist, Reno; Enoch Morrill, orchardist, Reno; John Guthrie, orchardist, Winnemucca, and the Chairman, all were present, except Mr. Guthrie, who resides at Winnemucca, about 225 miles distant.

Our State is comprehended between parallels 36 and 42 North, and meridians 114 and 120 West, varying in altitude from 3,800 feet to 10,000 feet above the level of the Pacific ocean. Our rainfall varies with altitude, from two to sixty inches per annum. Our temperature varies from zero to 95 degrees, our coldest weather being generally a period of about twelve days in the last days of November and in December before Christmas. During this season our ice crop is made.

January is commonly a pleasant month; February the buds often start on our trees and grass grows; March is cold, blustering—some times small fall of snow and thin ice formed; April is warm when March is cold, and *vice versa*, and usually the last days of May, 20th to 25th, bring cold nights and often thin ice.

Before this May chill buds are out and trees and flowers are blooming or out of blossom, and by this freeze our fruit is killed in the earliest observable fruit form. All varieties of fruit trees that flourish in the United States as far South as the Carolinas flourish here; our trees do not Winter-kill. All of the berries and small

fruits flourish, and when the late May frosts permit, bear bountifully of the most succulent and excellent varieties—large, handsome and very perfect fruit. Every seedling variety produces very perfect and excellent fruit after its kind. It is practically true to say there was never a poor peach grown in Nevada.

Seedling peaches here produce choice fruit, as a rule, which is not the rule in New York and other Atlantic low countries. Our atmosphere is dry because there is no water to moisten it.

The enemy and the only known enemy to fruit culture in Nevada lies in our climatic surroundings, and is due to altitude and lack of rainfall. Warm growing weather in January or February is succeeded by cold, freezing weather in March or April; May usually warm, and trees blooming in the early days, succeeded by cold days, frost and sometimes ice. Usually our fruit trees blossom very full, and many varieties bear annually.

In the judgment of your committee the great need of fruit growers in this State is late blooming varieties, or varieties that will not be affected by 30 degrees Fahrenheit for a continued period of twenty-four hours, when the tree is in blossom or the fruit in its earliest observable form. To the latter class belongs the Summer Belleflower, a Fall apple, in the orchard of Mr. A. B. Williams, Reno. This year the fruit in its early form, about the size of May Duke cherries, withstood the late frost and freeze, and is in medium bearing.

The Limber Twig is a good regular bearer and hardy with us, but a poor fruit.

[The report here details suggestions for the Catalogue, and then proceeds.]

None of these are in full bearing this year, not carrying 4 per cent. of the usual crop, owing to the late Spring frost that occurred about the first days of June this year, the cold continuing through several days.

Mr. W. W. Morton, of our committee, reported a seedling apple, tree large size, ten years old. From first bearing year had fruited well every year, and is in full bearing this year; variety, choice Winter, January to June; color, red, size of Spitzenberg—flesh white, flavor of Newtown pippin; tree tall, thrifty grower. The committee named it Morton.

We look to and ask the advice of the National Society in selecting varieties to suit our climate and fruit largely and regularly. We want quantity in fruit.

Our climate is sandwiched—warm growing January or February, cold March or April, early May warm, fruit and flowers blooming and iced last days of May, closes the incongruous opening of the year, and closes out our fruit of the varieties generally relied upon.

NORTH CAROLINA.

Reported by J. Van Lindley, of Pomona, Chairman of the State Fruit Committee of North Carolina.

In my report I will only note a few changes since report of 1885. This year, 1887, has proved to be the poorest fruit year ever known in this State, on account of the long, cold frosty weather after fruit had bloomed out. I cannot make the exhibit I intended to make this year. Pear blighted very badly in 1886, nearly all varieties. The Seckel, Early Green Sugar, Augouleme, Clairgeau seem to be clear of blight. The LeConte and Kieffer were brought forward as blight-proof pears, but out of 24 LeConte, on their own roots, grown from cuttings planted in 1882, seven have blighted during the past two years, and out of forty Kieffer, planted at the same time, budded on common French pear stock, only three have blighted, so I consider the Kieffer nearly blight proof, and it is a valuable pear for our State.

It bears very young, is very prolific and quality good.

No blight has appeared this year on any varieties.

Some new plums are being added. Mari-

anna, of the Wild Goose type, seems to be a promising variety; am well pleased with its growth and hardy appearance. Also of the new foreign plums from China and Japan, Prunus Simoni, Botan and Kelsey's Japan, they seem to be promising sorts for the South generally.

To the Strawberry add Hoffman Seedling, Early Canada, May King and Parry. For further report I will send you that of S. O. Wilson from Eastern North Carolina, and George E. Boggs, of the extreme western part of the State. They are members of the committee.

REPORT OF S. O. WILSON.

Mr. Wilson first details the markings on varieties for the catalogue of fruits. In speaking of grapes he says: All Labrusca, Estevalis, Riparia and Rotundifolia varieties do well; but all of Rogers and Arnold's Hybrids rot badly, except in favorable seasons.

Of new native varieties he remarks: McCuller's Winter apple, origin, Wake County, North Carolina; fine flavor and excellent keeper, specially adapted to the eastern and southern sections of the State. The greatest obstacles to success are late Spring frosts, insects, and poor culture. As to storing fruits and packages, he says: Great abundance of Winter apples grown in the western part of the State, kept in dry earth, and in general a very undesirable method. Strawberries are packed in square quart baskets, crated in 32's, grapes in ten and fifteen-pound baskets, peaches, five-eights slatted crates.

We have no method of collecting statistics, but we have abundant evidence that the interest in horticulture has increased 100 per cent. in the last ten years.

Grape-growing has increased 500 per cent. in ten years; varieties mostly planted for market, Concord, Ives, Champion, Martha, Delaware.

REPORT OF GEORGE BOGGS, WAYNEVILLE, N. C.

The elevated plateau of land lying between the Blue Ridge on the east and the Smoky Mountains on the west, embracing thirteen counties known as "Western North Carolina," offers advantages for fruit culture rarely equaled. The river valleys have an elevation of from 1,500 to 2,000 feet above the ocean, and these, with the uplands and mountain sides (the mountains being for the most part fertile to their peaks), with northern and southern exposures, give a variety of soils and climatic conditions well suited to the successful culture of all fruits known to temperate regions.

But few apples, comparatively speaking, have been even tested, and the older-bearing trees consist, for the most part, of Nickajack, Buff and Camac, but of late years others have been introduced, and are steadily supplanting these in more recently planted orchards. The Nickajack, with a few virtues, has some faults that render it unfit for culture. The tree is rather tender and a shy bearer. The fruit is hardly second-rate in quality and not specially attractive in appearance. It is a good keeper, of good size and a good shipper. The Buff is a large, bright striped apple, showy but of poor quality. In fact, it soon becomes so dry as to be well nigh unfit to eat. These two apples have done not a little harm in prejudicing many against apples grown in this section. The Camac, like the Buff, is a native, but a far better apple. It bears early and abundantly, and on rich, sandy loams the fruit is of fair size and of good quality, though lacking in richness. It is an excellent keeper, but lacks color for a market sort.

Careful observation convinces me that we should plant mainly of varieties that originate near the old Mason and Dixon Line. Rawle's Genet does well, saving its tendency to rot. The Ben Davis and Winesap, more recently introduced, succeed admirably.

PEARS.—But little grown, and yet I have seen as fine specimens of Bartletts grown here as I ever saw grown in regions noted for pear culture.

PEACHES.—Peaches do well at the lower altitudes, but are often killed in the bud at higher elevations.

PLUMS.—Have found none in cultivation, saving small Damson and Wild Goose. Finer kinds would undoubtedly do well if planted and cared for.

GRAPES.—Both soil and climate are admirably adapted to grapes.

Small fruits do well. Owing to sudden changes, with severe frosts this Spring, the fruit crop is almost a complete failure.

NOVA SCOTIA.

Reported by Charles E. Brown, of Yarmouth, Chairman of the Provincial Fruit Committee of Nova Scotia.

I have endeavored to discharge my duty as Chairman of the Fruit Committee for this Province of the American Pomological Society, by inviting contributions to report from Rev. J. R. Hart, of Annapolis County, Prof. H. Y. Hind, of Hart County, and C. R. H. Starr and R. W. Starr, of Kings County, sending each copies of the circulars forwarded to me. Mr. C. R. H. Starr attended at the London Colonial and Indian Exhibition last year, as Commissioner in charge of Canadian fruit, and from the experience thereby gained, should have material worthy of permanent record. All the above are resident in the three chief fruit counties of the Province, whence alone large shipments of apples are made by steamer to England through several months of the year.

From a Provincial Government crop report for August, 1887, I extract the following: "Last year the apple crop was reported from the fruit counties at fully twenty per cent. above the yield of any previous year, and the fruit of excellent quality, the most promising market sorts being Baldwin, Northern Spy, Gravenstein, Nonpariel, Rhode Island Greening, Ribston Pippin and Golden Russet; lots of the last named brought the highest prices at the late Winter sales in England." This year reports from several districts in these counties, as well as from nearly all the other counties of the Province, quite generally agree in predicting a crop considerably below the average; frost, cold, high winds, insect enemies and drought being variously assigned as causes for the diminished yield, bloom having been abundant. Nearly all the counties report rapid annual extension of orchards in the district. New orchards have been planted equal in extent to the entire area of the old. The members of the Nova Scotia Fruit Growers' Association look forward to the time when the whole Annapolis Valley, 400 square miles, will be one continuous orchard, producing an annual revenue of thirty millions of dollars. Extracts from report for 1886 of Nova Scotia Fruit Growers' Association (report for 1887 not yet published):

"What are the best six varieties of apples to cultivate for foreign markets, naming them in the order of merit? Nonpariel, Gravenstein, Ribston Pippin, Tompkins King, Blenheim, Golden Russet."

"The cranberry bogs of Aylesford will yet equal in value the dyked marshes of Cornwallis, or the orchards of Annapolis. Fifty acres between Kingston and Kentville have been prepared and planted during the past season."

"It was found that pear blight and peach yellows did not exist where potassium chloride was applied. The conclusion arrived at was, not that potassium chloride was a specific in the sense of being antagonistic to the growth of the blight, but simply that the soil, not having sufficient potash to supply the trees, rendered them liable to the disease."

PROFIT OF PLUMS.—Sharp & Shear, of New Brunswick, a year ago, from their small orchard sold 1,000 bushels of plums for $1,000 at their own door, and last year 1,500 bushels for $6,000. Fred F. Mitchel, of Grand Pie, the fourth year from plant-

ing, raised from the Weaver Plum tree two and a quarter bushels, and sold them for $10.69.

In previous reports I have commended the Ontario apple, a hybrid originated by the late Charles Arnold from the Northern Spy and the Wagener. Further experience confirms my good opinion of this variety; the original tree is a strong, thrifty grower, with large, thick leaves, and an annual bearer, the fruit above medium in size, and with me keeps sound until July. A number of scions set in 1884 are all bearing this year. The variety was distributed some years since by the Ontario Fruit Growers' Association, and must have had extensive trial in Ontario. If it succeeds elsewhere as here, it should go on the list of valuable apples, and merits two stars for Nova Scotia. Canada Baldwin takes the lead, in my small nursery, of a considerable number of varieties, for strong, annual growth, size and thickness of leaf; the fruit I have seen in March at an exhibition in Halifax, a brilliant, solid red, and a good dessert apple in quality. It has not yet fruited with me; has one star for New Brunswick alone; must be grown in Canada, and has probably been overlooked; should have at least one star for Nova Scotia.

Swayzie Pomme Gris is so dainty a dessert apple and a fairly long keeper, that it merits extensive trial and propagation, wherever it will succeed, and is productive; should be on the list; once known, its quality could command the highest market price.

Tetofsky gives me a surprise this season, every tree of it on my own grounds bears a heavy crop of fair, well grown apples.

At our last County Exhibition I found one dozen Grimes' Golden of unusual size, quite double several of the other dozens. Asking of the exhibitor: "How did you grow these so large?" The reply was: "By top grafting the Holley," a very large native seedling.

An Anecdote of Nomenclature.—Many years ago, in sending to the Massachusetts Horticulture Society a collection of Nova Scotia apples, obtained from several growers, I received a gentle reproof for sending to the city of Boston, in the State of Massachusetts, an apple named Stonewall Jackson. Some years subsequently, the late lamented Charles Downing wrote to me for specimens of the Stonewall Jackson apple of Nova Scotia, the obtaining of which led to a correspondence with the grower, which decided the fact that the variety originated with a Mr. Jackson, in whose stone wall the tree grew, hence the name. See 3d Appendix, Downing's Fruits.

I have looked carefully over the list of apples in report for 1885, and do not observe any other desirable change in marking, nor does my experience and observation of the last two years suggest any other remark on apples, pears, peaches or plums. As to the last in this county, the unusually dry and warm season has been so favorable to the increase of caterpillars, that many of the trained trees are reduced to the bare branches, every leaf devoured, the fruit withers and falls and the crop is lost.

In currants, Fay's Prolific and Lee's Prolific merit the star for Nova Scotia. Among a large number of English gooseberries on trial, and successfully grown here, the Yellow Amber is by far the best in quality, productive, free from mildew, of medium size, thin skinned, and when fully ripe, delicious. Industry should have a star if it goes on the list. Many of our growers value the Manchester strawberry as productive and profitable, and further experience shows that the Sharpless may be grown with success in the most parts of the Province. Give one star to each.

Mr. P. D. Kinney contributes the enclosed paper on small fruits, with the best wishes for such a meeting of the American Pomological Society as would have gratified our late venerated President, and for its continued usefulness and prosperity.

RHODE ISLAND.

Reported by Joseph H. Bourn, of Providence, Chairman of the State Fruit Committee of Rhode Island.

In the variable climate of Rhode Island uncertainty is proverbially attached to out-door fruits.

Of the new varieties of the grape, Eaton and Niagara appear to be adapted to our New England climate. Ulster and Empire State vines are doing well; the former falls from the bunch when fully ripe; the latter may prove to be too late in maturing. Strawberries have yielded not half their usual crop, owing to the decaying of the berries, when they were most abundant, caused by excessive moisture. A few good old strawberries we still value, like the Downing and Miner, and we are sorry to report the Sharpless as having fruited poorly; the Manchester has behaved indifferently, and the Pioneer has rusted badly. The May King has been as good as any early kind; the Downing, Miner, Jewell and Parry for medium; the Belmont, Jersey Queen and Mount Vernon for late. The varieties Jewell and Belmont took the grand prizes both here and in Boston, and they were truly splendid. The varieties Henderson, Daniel Boone, Cornelia, Vick, Indiana, Crimson Cluster, Bubach No. 5 and Sucker State do not warrant commendation, while the Itasca, Dewey, Jessie, Gold and Dorchester are novelties. A new native seedling called Early Rhode Island, has been marketed this year, of the color and size of the Crescent, and firm.

The Alexander peach ripened July 20th and promises to be our best and most useful early variety. When our peach trees produce more flowers than are needful, we find it beneficial to preserve the strongest, and pick off the inferior blossom buds; and summer pinching and thinning out the young wood, also aids the ripening and coloring of the fruit.

Fruit culture in Rhode Island, as elsewhere, makes the best progress where the ability of the trees and vines to resist frost, and not the degree of cold, can be determined by the favorable or unfavorable previous condition of soil, climate and locality. Overtaxing the capabilities of our trees is one of the greatest injuries to the quality of our fruits, for timely thinning improves the size and flavor, prolongs the lives of the trees and carries a fair compliment of fruit of the highest market value to maturity.

A tendency to gather late-keeping apples prematurely is too frequently observed among our orchard growers. None but sound, clear skinned, fully developed fruit will keep plump and juicy; should be moved as little as possible and not come in contact with substances that communicate objectionable flavors.

Flavors in Fruits.—All classes of fruit have their characteristic flavors, modified by locality and soil. Varieties in the several classes are usually so distinct as to be readily recognized by taste, unaided by other senses. The flavor of small fruits is the best, when the berries are taken fresh from the vines, canes and bushes, and grapes must mature before they are gathered, or they will not ripen at all. Some think that Northern fruits have a higher flavor than those raised at the South and West; whereas, if they should eat the same varieties that have matured, and that have just been gathered in those regions, they would no doubt taste as refreshing, and the peaches, plums and grapes may have an improved and more delicious flavor. Our native strawberries, raspberries, peaches, plums and grapes taste better to us because they are fresh and ripe. I am inclined to believe that soil, locality, methods of cultivation and age of trees, more influence the flavors of the apple than other classes of fruit. Young trees have usually fairer and larger specimens; but the juices from the fruits of trees of older growth are inclined to be of richer flavor. Varieties of

the apple in our Northern latitudes, that do not mature until cool weather, are recognized as having a more sprightly taste than the same kinds that ripen earlier at the South, and often than those that are grown on young trees on the fresh Western loam; which may result from a slower process in ripening, affecting the constituent parts; to ingredients in the soil, and climatic conditions, varied by heat, by cold and moisture.

Old Apple Trees.—The old apple orchards of Rhode Island are fast disappearing. Trees planted a hundred years ago and more may still be found bearing defective fruit; but their removal is demanded because they are unsightly, unhealthy and unprofitable. Tillage can no longer be an assistant to nature in perfecting her work. The stinted growth, the hollow trunk, the decayed and moss-covered branches, the exhausted condition of the soil are all indications of an impaired vitality, and the trees only encumber the ground as relics of former generations.

Obstacles to Pear Culture.—Diseases incident to the pear tree are thought to be better understood than formerly. Damp soils, we know, are not adapted to pear culture; and those that are over-rich often force the tree into so excessive luxuriant growth, as not to ripen the wood. Too much moisture in the ground causes the fruit to fall prematurely, and what remains on the tree is deficient in flavor. An excess of rain at the period of flowering is often so injurious as to prevent the development of the pollen grains and their transfer to the stigmas of the blossoms.

Parasitic plants often cover the limbs and foliage of our pear trees, and appropriate the sap intended for their support. Innumerable fungi also attack the wood, bark, foliage, and fruit. At the same time we are apt to find other causes of unhealthfulness as to suggest whether the existence of parasitic fungi is the cause or only the consequence of previous disease.

No variety should ever be recommended for cultivation that does not possess health or freedom from constitutional disease, hardiness, or the power of resisting the extremes of heat, cold and drought. No tree can long remain healthy when injured by the extremes of temperature; and diseased trees will be injured and destroyed sooner in a climate and soil that is not congenial to them.

Helps and Hindrances to Strawberry Growth.—In disseminating strawberry information, we are slow in imparting prominence to new varieties; knowing that this fruit generally does best where it originated, and that it often takes three to five years to decide upon its merits. The best results in strawberry culture can be obtained by observing a few plain rules after we have ascertained what are suitable varieties to grow. An abundance of strong bloom, followed by clusters of fruit, are all that is desired to assure us that our strawberries have been grown properly, and success will follow high culture and be especially secured if the right kind of nourishment is applied at the period of flowering and at the time of the coloring of the fruit. Strawberry plants grow well in old gardens and in light sandy soil, but bear little fruit; they drain the earth of moisture, take up the minerals and other valuable earthy constituents. They like land that has recently been broken up; and clay forked in about six inches of the top soil, helps to retain on the surface many of the youngest and most active feeding fibres. A firm upper stratum of earth no doubt encourages floriferousness, while early mulching keeps down the weeds, holds moisture, feeds the fibres, and forms, after being washed by the rain, a good bed for the berries to rest upon. So few new strawberries of first-class merit that crop freely are raised from seed that these qualities seem almost to be incompatible, and no uniform results to ascertain what influence the pollen has on size,

color and flavor, has been obtained by experiments.

We do not discard varieties of the strawberry because they are supplanted always by those of better quality, but for the reason that they do not maintain their character for healthfulness, hardiness and productiveness. This lack of vitality may be due to enervating methods of propagation; the mutations of seasons or climatic influences may contribute to these results while some of the rusts, mildews, rots and other fungus elements may be of a recent origin.

Thick planting, where the crowns are never as productive as they should be, is a great injury to strawberry culture. A crop is frequently lost by the depredations of slugs and beetles, also by wet, if the weather is moist at the period of ripening. Decay is witnessed when there is too dense foliage, which is avoided by having every stool stand clear, so that the crowns may ripen. Some varieties will degenerate more than others by incessant propagation from the same stock and from perpetual growth upon the same spot.

The strawberry plant is much affected by the soil in which it grows, and kinds that are prolific in one locality will not bear freely in another. In wet, cold land, the fruit sets thinly; a cool, damp autumn is not propitious to the ripening of the crowns, while late varieties are frequently prevented by drouth from setting their blooms. Blind plants, we observe, oftener appear in plantations formed with runner plants than from those that are forced.

A question for consideration arises, how beneficial the mulching of strawberries may be solely as a means of promoting moisture in the soil. Any covering of the earth, although it may prevent evaporation, will as surely prevent the absorption of heat. The surface of the earth is deprived of the action of the sun and air, agencies most useful in elaborating plant-food. It is not difficult to see how a mulch that simply retains moisture will counteract the beneficial effects of heat, light and air; that while it checks evaporation, it also retards the chemical action of the soil. The use of decaying substances for a mulch should always be avoided, for that portion in contact with the ground is apt to mildew and encourage fungus growth, which neither indicates nor promotes healthful vegetation.

Strawberries are far too numerous in variety; a list of the best for flavor, bearing, coming in early and keeping up the season's supply, is all that is desired. With new kinds, the tendency is to attach importance to size and weight of crop, rather than to good edible properties. Ready purchases are made of the large and good looking new varieties from the glowing descriptions which are annually made; that results in a number that are acid or flavorless.

Extensive experiments were made last year in sowing the seed of the native strawberry, without any deviation, except a marked increase in size of foliage and quantity of fruit on enormous stems; and this bed of a quarter of an acre was in close proximity to domestic varieties, receiving the same attention. These results lead to the conclusion that rarely is there any deviation in free nature where a large amount of cross-fertilization is taking place among various individuals of the same species, the tendency of which is to repress variation.

WASHINGTON TERRITORY.

Reported by C. W. Lawton, of Seattle, Chairman of the Territorial Fruit Committee of Washington Territory.

We have had an abundant crop of apples, pears, plums, cherries, peaches and quinces this year. Mr. Andrew Nelson, on the east side of the lake, has five acres of strawberries, from which he gathered this season 2,500 gallons of fruit. Mr. H. D. French has two acres in strawberries, and his crop reached 1,400 gallons, and

this, too, from plants set out five years ago.

Mr. Nelson has also about one thousand fruit trees of various kinds, and they look promising, all being healthy and vigorous.

Apricots are always killed by frosts in the Spring, and the January growth on quince trees is sometimes cut off by the same.

The cherry crop this year was injured by a long and severe drouth, and the plum crop was also injured in some localities.

WEST VIRGINIA.

Reported by D. H. Strother, of Charlestown, Chairman of the State Fruit Committee of West Virginia.

The fertile lands of West Virginia on the eastern and western slopes of the Alleghenies, in the valleys between the ranges, in the sheltered coves, level terraces and elevated plains of these mountains, afford so great a variety of soils, climates and accidental advantages that all the fruits belonging to the temperate zone may be successfully cultivated some where in the State.

This broken topography has at the same time so isolated much of the population, and divided the populated districts from each other so inconveniently, that it has hitherto been impossible to obtain any satisfactory or comprehensive statistics on the subject of fruit growing in the State at large, and the following report is made up chiefly of personal experience in the eastern counties, observations made at different times in the central and western districts, and such meagre information as I have been enabled to glean from correspondents.

Since 1866 fruit culture in this State has greatly improved and extended, and in spite of many disappointments and local failures, it continues to progress, while proper methods of culture and adaptation of varieties to soil and climate require more earnest and intelligent attention.

Nomenclature.—The catalogue names of the standard varieties most generally disseminated, and whose fruit is easily known and recognized, are generally preserved and current among cultivators. The nomenclature of native seedlings and new varieties introduced experimentally, is involved in confusion and uncertainty. People lose the labels and forget the titles of the trees; orchards are transferred by sale and purchase with no record of the plantings. Nurserymen and travelling agents fill specific orders from stock they may happen to have on hand without the slightest regard to identity, so that after waiting from seven to ten years, the cultivator finds a fruit entirely different from what he had anticipated, and to him nameless. Hence, a great proportion of the fruit raised in this country is distinguished by a local name, or has none at all.

Obstacles and Enemies.—Probably the most formidable obstacle to successful fruit culture in this State is carelessness and lack of proper information on the subject. Next, the uncertainties and extremes of the climate, late Spring frosts and occasional intensity of the cold in Winter.

Insects, native and imported, of many species known to entomologists, are very numerous and destructive. The more isolated and secluded regions are less infested. Where the cultivator makes a continued and energetic defence against these pests he is generally successful.

Culture and Pruning.—Orchards that are regularly cultivated and fertilized like cabbage beds yield the most regular and abundant crops. When young, the space ground is usually utilized by sowing it in oats, rye or grass, omitting this as the trees spread, when most farmers leave the ground in grass, which saves trouble, but in my judgment does not produce the best results. Apple trees, as most other tree fruits, are left to grow naturally, and pruned from the beginning with a pen-

knife, at any season that may be convenient, never permitting a superfluous or misplaced twig to grow larger than one's finger. Peach trees are generally left to grow as nature dictated. Pears, cherries and plums are trimmed to shape early, and then let alone, so are quinces.

STORING AND KEEPING WINTER FRUITS.—Apples are usually stored in cellars, pits or sheltered rooms, where they may be kept dry and wont freeze; sometimes in barrels, often in heaps, covered with hay or straw. As a rule, apples of the same varieties ripen earlier and will not keep so long as in the North. I have packed the Winter Sweet Paradise in December, in barrels with ground plaster, storing it in a cool, dry room, sheltered from frost. I opened the barrel in June the year following and found the fruit, with few exceptions, in perfect condition. We ate the last of them on July 9th, most of the specimens of high flavor and without blemish. The plaster was afterward available as a fertilizer.

Pears are stored to ripen in drawers, on shelves or spread on floors and covered. I have eaten delicious Vicars in February, ripened on the garret floor. I know of no other fruits that are kept fresh.

Apples, peaches, grapes and small fruits are exported to the Northern cities, in the boxes, barrels, crates and baskets in common use elsewhere.

STATISTICS.—From the causes explained in the introduction to this report, I have not any reliable data on this subject.

Mr. Strother closes his report with a very complete list of suggestions for the catalogue.

Note and Suggestion

In the catalogue accompanying the present volume, a few of the newer varieties have been omitted, although appearing in the reports of the Chairmen of the State Fruit Committees. It has been thought best not to place them in the catalogue until more fully tested and their merits become better known. In a few instances their correct names have not been fully determined, and in others no description has as yet appeared in any standard pomological works. I would also suggest that those who send in the names of new fruits send with the same a full description of the fruits, or at least one to correspond with the plan adopted in the catalogue. This will save the general chairman a vast amount of work in looking for descriptions in catalogues and pomological works; and further, it frequently occurs that no description of new and local varieties has ever appeared in print, and in some instances those that have been published are not to be depended upon as authentic or trustworthy.

A. S. FULLER,
Chairman General Fruit Committee,
Ridgewood, N. J.

CATALOGUE OF FRUITS.

PLAN OF CATALOGUE.

The arrangement of the names of varieties in the Catalogue is alphabetical and according to the nomenclature adopted by the Society. Synonyms are given in a few instances where it seemed necessary, and these are placed under the adopted names in italics.

The columns are arranged thus: In the first the names of varieties, in the next seven columns the description, and in the remaining columns the States or Districts.

The State or District columns are not placed in alphabetical order, as in the octavo editions, but are grouped in *Divisions* somewhat similar in climate, and other characters affecting fruit culture. Thus: 1.—Northern Division—between 42° and 49°. 2.—Central Division—between 35° and 42°. 3.—Southern Division—between 28° and 35°.

The State or District in which a fruit is recommended for cultivation is designated by a star (*), and if the variety is of great superiority and value, two stars (**); if new or recently introduced and promising, by a dagger (†).

I. APPLES.

EXPLANATION OF ABBREVIATIONS.—The SIZE is understood by l. for large; m. for medium, and s. for small. The FORM—r. c. for roundish conical; ob. for oblong; r. ob. for roundish oblate; fl. for flat or oblate; r. for roundish. The COL. y. r. for yellow and red; r. s. for red striped; g. y. for greenish yellow; rus. for russeted; y. rus. for yellow and russet. The QUALITY—g. for good; v. g. for very good; b. for best. The USE—F., fruit valuable for all family purposes; K. M., valuable for kitchen or market purposes; F. M., family and market. The SEASON—S. for summer; E. A. for early autumn; L. A. for late autumn, and W. for winter. All these characters of course only designate leading positive features, and vary in their distinctness according to soil and climate in which they are grown. The ORIGIN is shown by Rus. for Russian; Eng. for English; Am. for American; Ger. for German; F. for foreign.

Number	Names	Size	Form	Color	Quality	Use	Season	Origin	Nova Scotia	New Brunswick	Maine	New Hampshire	Vermont	Massachusetts	Rhode Island
		DESCRIPTION.							I. N. Div.-						
1	Alerson's Early	m.	r.	y.	v. g.	K.	S.	Am.							
2	Alexander	l.	r. c.	r. s.	g.	K. M.	E. A.	Rus.							
3	American Beauty	l.	r. ob.	y. r.	v. g.	F. M.	W.	Am.							
4	American Golden	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.							
	American Golden Pippin.														
5	American Summer	m.	ob.	y. r.	b.	F.	S.	Am.							
	American Summer Pearmain.														
6	Arnold's Beauty	m.	fl.	y. r.	v. g.	F.	W.	Am.							
7	Aromatic Carolina	l.	fl.	y. r.	v. g.	F.	A.	Am.							
8	Autumn Bough	m.	r. c.	g. y.	v. g.	F.	E. A.	Am.							
9	Autumn Swaar	m.	r. ob.	g. y.	v. g.	F.	L. A.	Am.							
10	Bailey Sweet	l.	r. c.	r. s.	v. g.	F. M.	L. A.	Am.							
11	Baker	l.	r. c.	y. r.	v. g.	K. M.	W.	Am.							
12	Baldwin	l.	r. c.	r. g.	v. g.	F. M.	W.	Am.							
13	Baltimore	m.	r. c.	r. y.	v. g.	F. M.	W.	Am.							
	[illegible]														
14	Baltzby	l.	r. ob.	y.	g.	F. M.	A.	Am.							
15	Beauty of Kent	l.	r. c.	r. s.	g.	K. M.	L. A.	Eng.							
16	Belden Sweet	m.	r. [illegible]	y.	g.	F.	W.	Am.							
17	Belmont	l.	r. [illegible]	y. r.	b.	F. M.	W.	Am.							
18	Ben Davis	l.	r. [illegible]	y. r.	g.	K. M.	W.	Am.							
	[illegible]														
19	Benoni	m.	r. ob.	y. r.	v. g.	F. M.	S.	Am.							
20	Bentley's Sweet	m.	r. ob.	g. y.	v. g.	F. M.	W.	Am.							
21	Berkshire Spy	m.	r. c.	r. s.	v. g.	F.	E. W.	Am.							
22	Bethlemite	l.	r. ob.	y. r.	[illegible]	F. M.	W.	Am.							
23	Bevan's Favorite	m.	fl.	y. r.	g.	F.	S.	Am.							
24	Black Apple	m.	fl.	d. r.	g.	F.	W.	Am.							
	[illegible]														
25	Blenheim Pippin	l.	r. [illegible]	[illegible]	[illegible]	F. M.	W.	Eng.							
26	Blue Pearmain	l.	r. c.	[illegible]	[illegible]	M.	W.	[illegible]							
27	Bonum	l.	r. ob.	[illegible]	v. g.	M.	L. A.	Am.							
28	Borsdorf	m.	r. [illegible]	[illegible]	[illegible]	M.	L. A.	Ger.							
29	[illegible] Favorite	m.	r. [illegible]	[illegible]	[illegible]	M.	A.	Am.							
30	[illegible] Nonpareil	l.	fl.	[illegible]	[illegible]	F. M.	W.	Am.							
31	[illegible] Sweet	[illegible]	[illegible]	[illegible]	[illegible]	M.	L. A.	Am.							
32	Broadwell	[illegible]	r. c.	g. y.	v. g.	F. M.	L. A.	Am.							
33	Brittle Sweet	m.	r. [illegible]	[illegible]	[illegible]	F.	E. A.	Am.							
34	Brown	l.	fl.	[illegible]	[illegible]	F. M.	L. A.	Am.							
	[illegible]														
35	[illegible] Summer	l.	.....	.....	.....	.....	S.	Am.							
36	Buckingham	l.	[illegible]	y. [illegible]	v. g.	F. M.	L. W.	Am.							
	[illegible]														
37	Buff	l.	r. ob.	y. r.	g.	F.	W.	Am.							
38	Bullington's Early	m.	fl.	y.	g.	F.	S.	Am.							
39	Bullock's Pippin	s.	r. c.	y. russ.	b.	F. M.	W.	Am.							
	[illegible]														
40	[illegible] Pippin	m.	fl. c.	y. r.	v. g.	F. M.	W.	Am.							
41	Cadwallader's Golden	m.	r. ob.	y.	g.	K. M.	W.	Am.							
42	[illegible] Sweet	l.	r. ob.	y.	v. g.	.....	W.	Am.							
43	Calkin's Pippin	l.	r. c.	y. r.	g.	F. M.	W.	N. S.							
44	[illegible] Sweet	m.	r. ob.	y.	g.	F. M.	W.	Am.							
45	[illegible]	m.	r. ob.	[illegible] r.	g.	M. K.	W.	Am.							
46	Canada Baldwin	m.	ob.	r.	v. g.	.....	W.	Can.							
47	Canada Reinette	l.	r. c.	g. y.	g.	F. M.	W.	F.							
48	[illegible]	m.	r. c.	r. s.	v. g.	F.	W.	A.							
49	Carolina June	m.	r. c.	r. s.	v. g.	F. M.	S.	Am.							
	[illegible]														
50	[illegible]	m.	fl. c.	g. y. r.	g.	M.	S.	Am.							
51	Carter's Blue	l.	r. ob.	g. r.	v. g.	F. M.	E. A.	Am.							
52	Cane Creek Sweet	m.	r.	y.	g.	F.	S.	Am.							
53	[illegible]	m.	fl.	y.	g.	M.	W.	Am.							
54	[illegible]	m.	ob. c.	g. y.	v. g.	F. M.	L. A.	Am.							

2 Moderate bearer; showy, hardy.

[illegible] Slender grower, but healthy.

12 In Vermont adapted only to the Southern and Western parts of the State south of Burlington.

NUMBER	NAMES.	DESCRIPTION: SIZE	FORM	COLOR	QUALITY	USE	SEASON	ORIGIN	U.-N. DIV: Nova Scotia	New Brunswick	Maine	New Hampshire	Vermont	Massachusetts	Rhode Island
	Chenango Strawberry, Sherwood's Favorite.														
55	Clark's Pearman	m	r. ob	y	v. g.	M.	W	Am							
56	Clayton	l	c.	y. r	g	F. M	W	Am							
57	Clyde Beauty	l	r. c	g. r	g.	F. M	W	Am							
58	Cooper	l	r. ob	g. y	g.	M	L. A	....							
59	Cooper's Market	m	r. c	y. r	g.	M	W	Am							
60	Cooper's Early	m	r	y	g.	M	A	Am							
	Cooper's Early White.														
61	Cogswell	m	r. ob.	y. r	b	F. M	W.	Am.							
62	Cole's Quince	l	r. ob.	g. y	v. g	F. M	W	Am							
63	Colvert	l	r. ob.	y. r.	g.	F. M	L. A	Am							
64	Cornell's Fancy	m	ob	y. r	g.	F. M	L. A	Am							
65	Cox's Orange	m	ob	y. r	v. g	F	E. A	Eng							
	Cox's Orange Pippin.														
66	Cracking	l	r. ob	y	g	K	L. A	Am							
67	Creek	m	fl. c.	y. r	v. g	F. M	W	Am							
68	Cross	l	r. ob.	r. s.	v. g	F. M	S	Am.							
69	Cullasaga	m	r. c.	y. s	g	M.	W	Am							
70	Curtis Sweet	l	r. c	y. r.	g	K	L. A	Am							
71	Danvers Sweet	m	r. ob	g. y	v. g	F. M	W	Am							
	Danvers Winter Sweet														
72	Dean	m	fl	r. s	v. g	F. M	E. A	Am.							
73	Detroit Red	m	r. ob	r	g.	F. M	E. W	Am							
74	Disharoon	m	r. c	g	g	F. M	A	Am							
75	Dominie	m	r. ob	g. r	v. g	F. M	W	.....							
76	Drap d'Or	l	r. ob.	y	v. g	F	S	Ger							
77	Dutch Mignonne	m	r. ob	r. s	g	M	W	Ger							
78	Dyer	m	r	g. y	v. g	F	E. A	F							
	Pomme Royal														
79	Early Harvest	m	r. ob	g. y	v. g	F. M	S	Am							
80	Early Margaret	m	r.	r. s	v. g.	F. M	S	Ger							
	Early Red Margaret														
81	Early Joe	s	fl	y. r	b	F	S	Am							
82	Early Pennock	l	r. c.	g	g	M	S	Am							
83	Early Strawberry	s	r	r. s	v. g	F	S	Am							
84	Early Ripe	m	r. ob.	y	g.	F	S	Am							
85	Edgar Red Streak	l	r. ob.	r. s	v. g	F	W	Am							
	Walbridge														
86	Edward's Early	...	.....	.....	.....	......	S	Am							
87	English Russet	m	r. c	y. rus	v. g	F. M	W	Eng.							
	Poughkeepsie Russet														
88	Esopus Spitzenburg	l	ob	y. r.	b	F. M	W	Am				†			
89	Etowah	m.	ob. c	y. r.	g	......	W	Am							
	Cooper's Red														
90	Eustis	m	r. ob	r. s	v. g	F	E. W	Am							
91	Eutaw	....	....	.....	....	.....	A.	Am							
92	Evening Party	m	fl	r	v. g	F. M	W	Am							
93	Ewalt	l	r.	y. r	g	M	W	Am							
94	Excel	l	ob. c	y. r	v. g	F. M	W	Am							
95	Fallawater	l	r. c	g. y	g	M	W	Am	*						
	[illegible]														
96	Fall Harvey	l	r. ob	g. y	g	M	L. A	Am	*						
97	Fall Jennetting	l	fl	g. y	g	M	E. A	Am				†			
98	Fall Orange	l	r	y. r	g	K. M	L. A	Am							
99	Fall Pippin	l	r. ob.	g. y	v. g	F. M	L. A	Am				†			
	Holland Pippin erroneously.														
100	Fall Queen	m	ob. c	y. r	g	F. M	A	Am							
	Haas, Gros Pommier														
101	Fall Wine	m	r. ob	r. y	b	F	L. A	Am							
102	Fameuse	m	r. ob	r. s	v. g	F. M	W	F							
	[illegible]														
103	[illegible]	m	fl. c	y. r	v. g	M	S	Am							
104	[illegible]	m	fl	r. s	v. g	F. M	S	Am							
105	[illegible]	l	fl	[illegible]	g	......	W	Am							

[illegible]

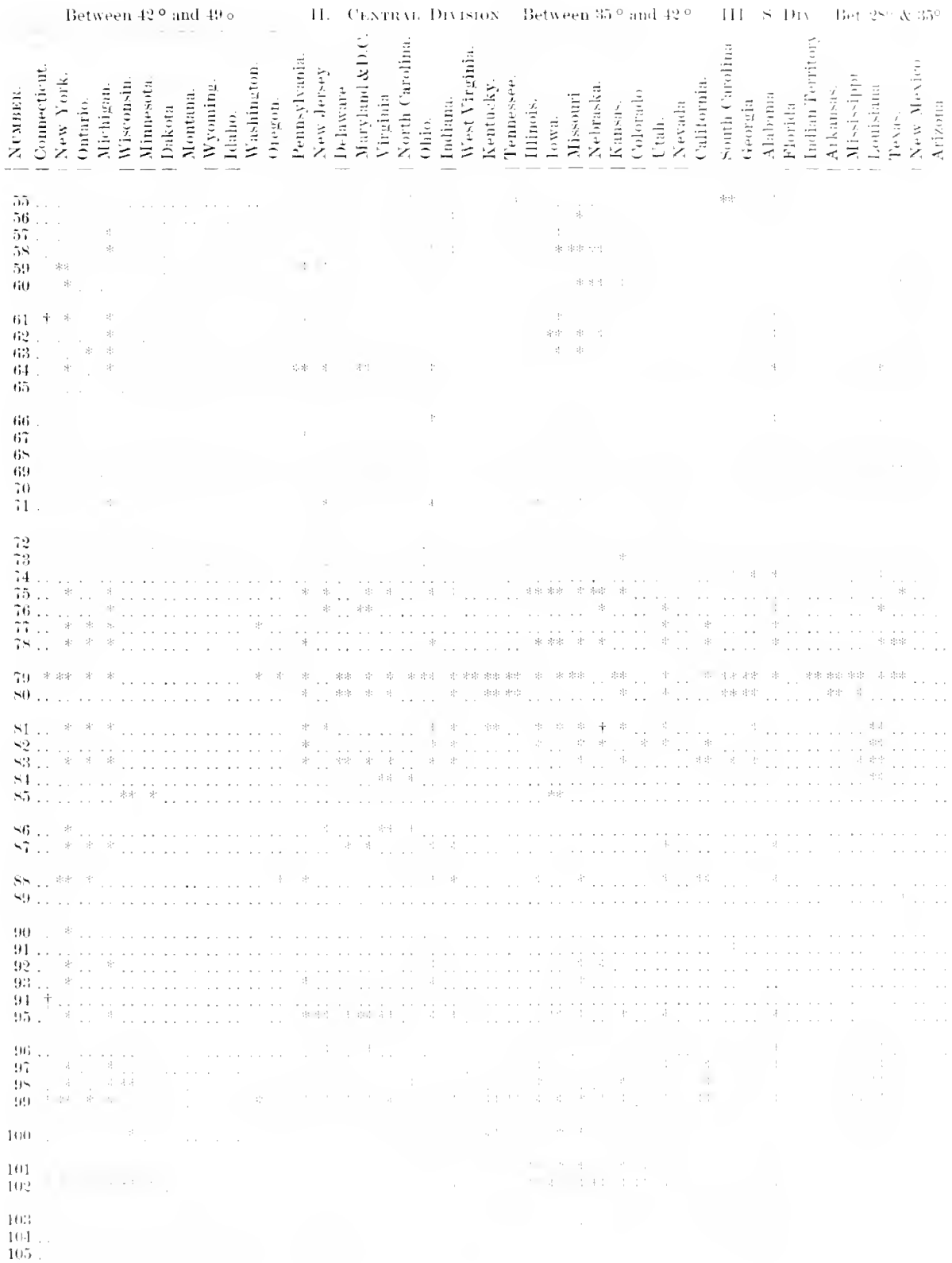
[illegible]

[illegible] on strong soil

81 A delicious table sort; tree of small growth.

82 Popular market sort.

83 Continues a long time after ripening; often called Red Juneating.



102 A hardy tree; one of the best of the North and West.

Number	Names	Size	Form	Color	Quality	Use	Season	Origin	DESCRIPTION. I.—N. Div. Nova Scotia	New Brunswick	Maine	New Hampshire	Vermont	Massachusetts	Rhode Island
106	Ferris	m.	r. fl.	y. r.	g.	F. M.	W.	Am.							
107	Fink	m.	fl.	y. r.	g.	M.	L. W.	Am.							
108	Fourth of July	m.	r. ob.	r. s.	g.	M	S.	Ger.	†						
109	Faust's Winter, *Faust*	m.	r.	y. r.	g.	.....	W	Am							
110	Foundling	m.	r. ob.	y. r.	g.	F.	A.	Am.				†	**	*	*	†
111	Fulton	m.	fl.	g. y.	g.	M.	W	Am.							
112	Gabriel	m.	r. ob.	r. y.	g.	M.	L. A	Am.							
113	Garden Royal	m.	r. ob.	y. r.	g.	F	S	Am.				*		*	*	*
114	Garretson's Early	m.	r. c.	y.	g.	K.	A.	Am.							
115	Gilpin	s.	r. c.	y. r.	g.	M	W	Am.					*			
	Carthouse, Little Romanite.														
116	Goff	l.	fl	y. r.	v. g.	K. M.	S	Am.							
117	Golden Ball	l	r.	y.	g.	F.	E. A	Am.							*
118	Golden Dixie	m	r. ob	g. y.	v. g.	F. M	S.	Am							
119	Golden Russet of Western New York	m.	r. ob.	y. rus.	v. g.	F. M.	W.	.....	**				**		
120	Golden Sweet	l.	r.	g. y.	v. g.	F. M.	S	Am	*				**	*	*
121	Granite Beauty	l.	r. ob	y. r.	g.	F. M.	W.	Am.				†	*	*		
122	Gravenstein	l.	r. ob.	y. r.	v. g.	F. M.	L. A.	Ger.	**			**	**	**	**	**
123	Green Cheese	m.	fl.	g. y.	v. g.	F. M.	W.	Am.								
124	Green Sweet	m.	r. ob.	g. y.	g.	K. M.	W.	Am.						*	*	
125	Grimes' Golden	m.	r. ob.	g. y.	v. g.	F.	W	Am.	*				*			
126	Gully	m.	fl	g. y.	v. g.	F	W	Am								
127	Hall	s.	fl	y. r.	v. g.	F.	W	Am.								
128	Hamilton	l.	r.	y. r.	g.	F. M.	A	Am.								
129	Haskell Sweet	m	fl	g. y.	v. g.	F	E. A	Am.						*		
130	Hawthornden	m.	r. ob.	g. y.	g.	K. M.	E. A	F.					*			*
131	Hartford Sweet	l.	r. ob.	r. s.	g.	M	W.	Am								
132	Hewes' Crab	s	r.	y. r.	g.	Cider	L. A	Am.								
	Hewes' Virginia Crab.															
133	Higby Sweet	m.	r. c.	y. r.	v. g.	F.	L. A	Am							†	
134	High Top Sweet	s	r	g. y.	v. g.	F. M.	S.	Am.				*		*	*	
	Sweet June.															
135	Hockett's Sweet	m.	r. ob.	y. r.	g.	K.	W.	Am.								
136	Holland Pippin	l	r.	g. y.	g.	K. M.	L. A.	F.						*		
137	Holly	m.	r. ob.	y. r.	g.	K.	W.	Am.								
138	Hoover, *Black Coal*	m.	r.	y. r.	v. g.	F. M.	W.	Am.								
139	Horn	m.	fl	g. r.	v. g.	F. M.	L. W.	Am.								
140	Horse, *Haas*	l	r.	y. r.	g.	K. M.	S.	Am.		**						
141	Hubbardston	l.	r. c.	y. r.	v. g.	F. M.	W	Am.	**		**		*	**	**	**
	Hubbardston Nonsuch															
142	Hunt Russet	m	r. ob.	y. rus.	v. g.	F. M.	W	Am.						**		
143	Huntsman's Favorite	l.	ob.	y.	v. g.	F. M.	W	Am.								
144	Hurlbut	m.	r. ob.	y. r.	g.	F. M.	L. A.	Am.	†			†	*		*	*
145	Irish Pippin	m.	r	r. s.	v. g.	F. M.	E. W.	Am.								
146	Jefferson County	m.	r. ob.	y. r.	g.	F. M.	W	Am.								
147	Jefferis	m.	r. ob	y. r.	v. g.	F. M.	E. A.	Am.				†				
148	Jersey Sweet	m.	r	y. r.	v. g	F. M.	E. A.	Am.						*		*
149	Jewett's Red	m.	r. ob.	r.	g.	F. M.	W	Am.	*			**	**	*		
	Jewett's Fine Red.															
150	Jonathan	m	r. c.	y. r.	v. g.	F. M	W.	Am.					**	**	*	*
151	Julian	m.	fl c.	w. r.	g.	K.	S.	Am.								
152	Junaluskee	m.	r. ob.	g.	v. g.	F. M.	W.	Am.								
153	Kentucky Red	m.	r. c.	g y. d r	g.	F. M.	A	Am.								
	Kentucky Red Streak. Bradford's Best.															
154	Kentucky	l.	r. c.	y. r.	g.	M.	L. A.	.....								
155	Keswick Codlin	m.	r. c.	g. y.	g.	K. M	E. A.	Eng.	*							
156	Key's Fall	m.	r.	rus.	v. g.	F. M.	E. W	Am.								
157	Kinnaird's Choice	m.	fl.	y. r.	g.	F. M	W	Am.								
158	Kinney's Winter						W	.....								
159	Kirkbridge	m.	ob.	g. y.	g.	K. M	E. A	.....								
	Kirkbridge White.															
160	Klaproth	m.	fl.	y. r.	g.	K. M.	E. A.	Am.								
161	Lady Apple	s.	fl.	y. r.	v. g.	F. M	W.	F							*	
162	Lady's Sweet	l.	r.	y. r.	v. g.	F. M	W.	Am.					*	*	*	**

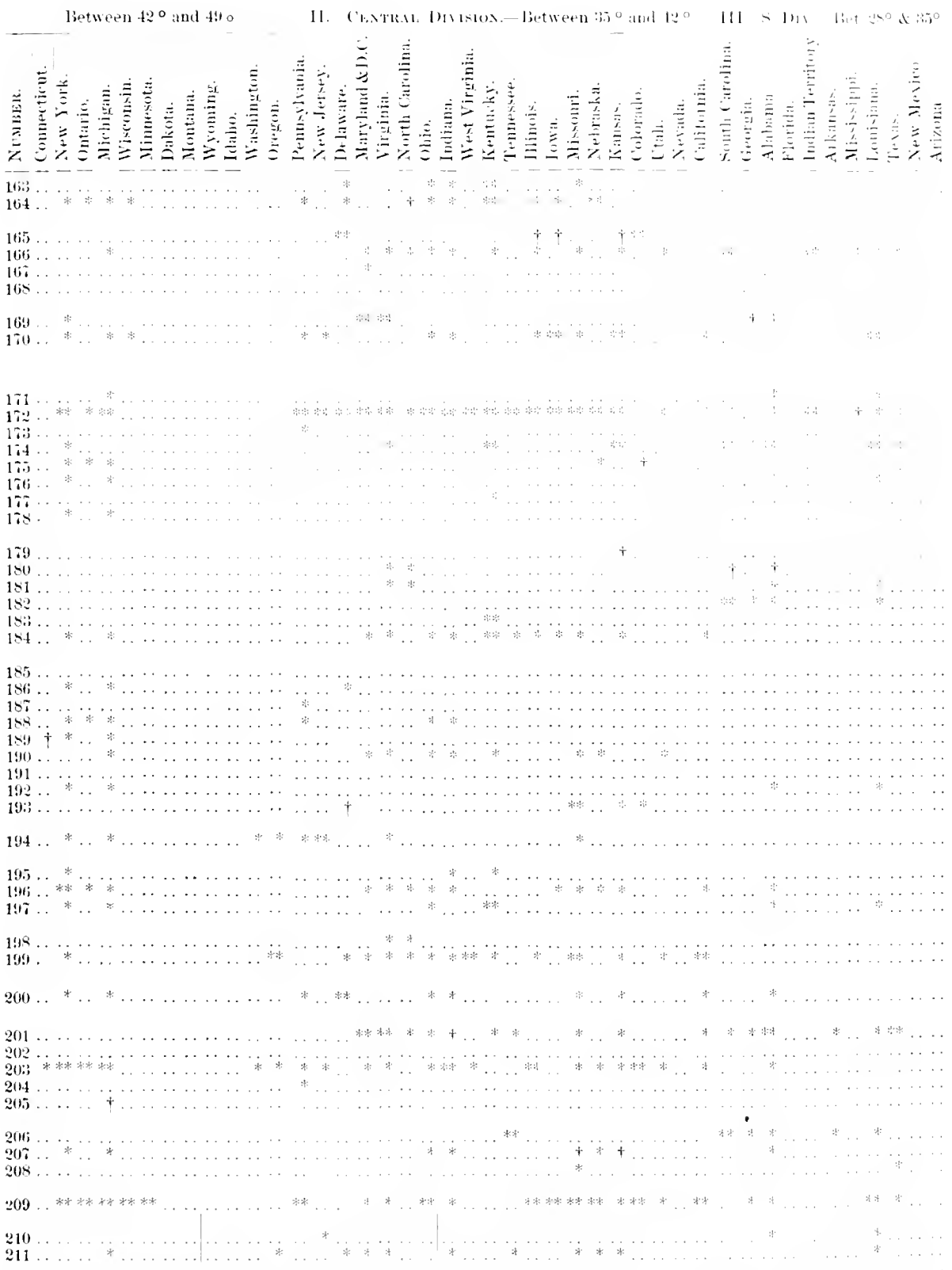
107 Valuable as a very late keeper and for cider.
108 Very hardy tree and handsome fruit.
113 Of a delicious pear flavor.
122 Ripens early and keeps late.
123 One of the best south.
130 One of the most profitable of market sorts

132 Valued only for cider.
133 A delicious dessert apple

142 A hardy tree and fine fruit. Supposed to be identical with Golden Russet of Mass., but not fully decided.
148 Very valuable for market or stock

Number	NAMES.	DESCRIPTION. Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	I.—N. Div.— Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
163	Lansingburg	m.	r. fl	y. r.	g.	M.	W.	Am.							
164	Late Strawberry	m.	r.	y. r.	v. g.	F. M	L. A.	Am.					*		†
	Autumn Strawberry.														
165	Lawyer	l.	r. ob.	y r.	v. g.	F. M.	W.	Am.							
166	Limber Twig	m.	r. ob.	y. r.	g.	M.	W.	Am.							
167	Long Island Russet	m.	r.	rus.	....	K.	W.	Am							
168	Lorne	l.	r. fl.	g. r.	v. g	F. M.	W.	N. S.	*						
	Marquis of Lorne														
169	Loudon Pippin	l.	fl.	y. r.	g.	M.	W.	Am.			*				
170	Lowell	l.	r. c.	g. y.	v. g.	F. M	E. A.	Am.	*				*		
	Orange, Tallow Pippin, Queen Anne, Michigan Golden Pippin.														
171	Lyscom	l.	r.	g. y.	g.	F. M.	E. A.	Am.	*					*	*
172	Maiden's Blush	m.	r.	g. y.	g.	K. M.	E. A.	Am.	†			*	*	*	*
173	Major	l.	r. fl.	g. r.	v. g.	F. M.	W.	Am							
174	Mangum	m.	r. ob.	y. r.	v. g.	F. M	W.	Am.							
175	Mann	m.	r. ob.	y. r.	v. g.	F. M.	W.	Am.					†		†
176	Manomet	m.	r. ob.	y. r.	v. g.	F. M.	E. A.	Am						*	
177	Mary Womac	l.	r. fl.	y. r.	v. g.	F. M	W.	Am.							
178	Maston's Red	m.	r. c.	r. s.	v. g.	F.	W.	Am.				*			
	Marston's Red Winter.														
179	Mason's Orange	v. l.	ob.	y.	g.	F. M.	W.	Am.							
180	Mason's Stranger	m.	fl.	y. r.	v. g	F. M.	W.	Am.							
181	Mattamusket	s.	fl.	y. r.	g.	F. M	W.	Am.							
182	Maverack Sweet	m.	r. ob.	y. r	v. g.	M	W.	Am.							
183	Maxy	m.	r. c.	g. r.	g.	F. M.	W.	Am.							
184	McAfee's Nonsuch	l	r. ob.	y. r.	v. g.	F. M.	W.	Am.							
	Large Striped Pearmain.														
185	McIntosh Red	m.	r. ob.	y. r.	v g.	F. M.	W.	Am.					†		
186	McLellan	m.	r. ob.	y. r	v. g.	F. M.	W.	Am.					*		*
187	Mellinger	m.	r. c.	r. s.	v. g.	F. M.	E. W.	Am.							
188	Melon	m.	r. ob.	y. r.	b.	F. M.	W.	Am.						*	*
189	Mexico	m.	r. ob	r. s.	v. g.	F. M	A.	Am.							†
190	Milam	m.	r.	r. s.	g.	K. M.	W.	Am.							
191	Milden or Milding	l	fl.	y r.	v g	F. M.	E. W.	Am.				**	*		
192	Minister	l.	ob.	r. s.	g.	K. M	L. A.	Am.			**	*		*	
193	Missouri Pippin	l.	r. ob	y. r	g.	M	W.	Am.							
	Missouri Keeper.														
194	Monmouth Pippin	l	fl.	y. r	v g.	F. M.	W	Am.							
	Red Cheek Pippin.														
195	Moore's Sweet	m.	r. ob.	r	g.	K	W.	Am.							*
196	Mother	m.	r. c.	y. r	b.	F. M.	W.	Am.	*		**	**	*	*	*
197	Munson Sweet	m.	fl	y. g.	g.	K. M	L. A	Am.	*						
	Orange Sweet.														
198	Nansemond Beauty	m.	r ob.	r. s.	v. g	F. M.	W.	Am.							
199	Newtown Pippin	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.		†					
	Albemarle Pippin, Brooke's Pippin														
200	Newtown Spitzenburg	m	r ob.	y. r.	b.	F. M.	W.	Am	†						
	Vandeveer of New York.														
201	Nickajack	l.	r. ob.	r. s.	g.	F. M	W.	Am.							
202	Nonpareil Russett	m.	r.	y. g.	g.	F. M	W.	Eng.	*						
203	Northern Spy	l	r c.	y. r.	b.	F. M.	W.	Am.	**		**	***		*	*
204	Northampton	m.	fl	r. s	v g.	F.	E.W.	Am.							
205	Oakland	m	r ob.	y. r.	v g.	F	W.	Am.							
	Oakland County Sick no Further.														
206	Oconee Greening	m	ob.	y.	g.	.....	A.	Am.							
207	Ohio Nonpareil	l.	r. ob.	y. r.	v. g	F. M	L. A	Am.							
208	Ohio Pippin	l.	r. ob.	y. r.	g.	.....	W	Am.							
	Shannon.														
209	Oldenburg	m	r. ob.	y. r.	g.	M.	S.	Rus.	*	*	*	*	*	*	*
	Duchess of Oldenburg.														
210	Orange Pippin	m.	ob.	y.	v. g.	F. M.	A.	Am.							
211	Ortley	m.	ob.	g. y.	v. g	F. M.	W.	Am.							

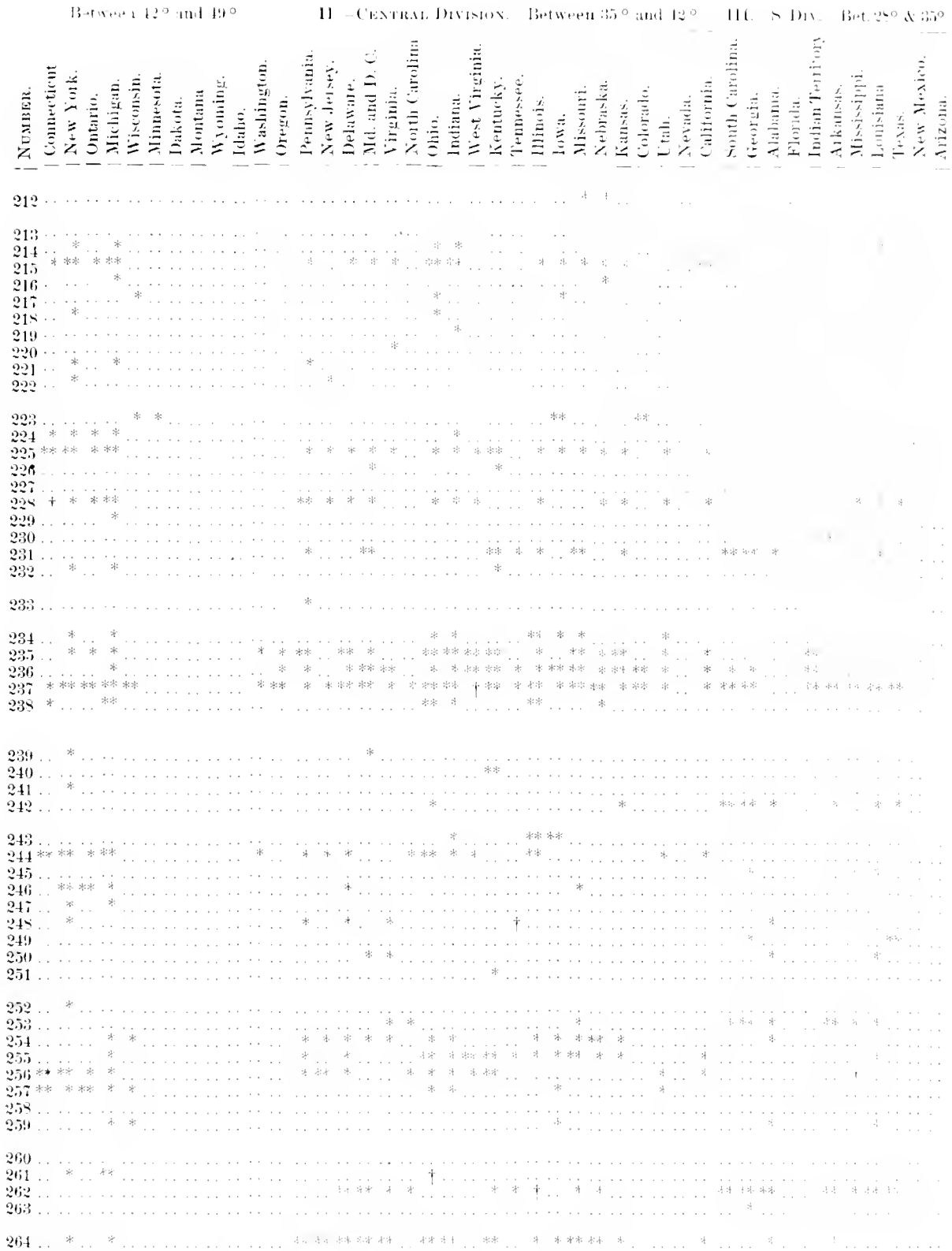
166 Hardy and productive Southwest
172 A profitable market sort
176 A valued sweet apple
177 A seedling from Rambo, which it resembles.
188 One of the most delicious apples; tree a poor grower
196 Esteemed where known.



201 This apple is known in South and West by over forty different names.
207 Esteemed where known.
209 One of the most hardy varieties.
211 An old variety; extensively planted at the West 25 or more years since

Number	Names.	Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	I.—N. Div. Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island.
	White Bellflower, Woolman's Long.														
212	Otoe Red	m.	r. ob	y. r.	v. g.	F. M.	W.	Am.							
	Otoe Red Streak.														
213	Peach of Montreal	m.	r. c.	y. s.	v. g.	F. M.	A.	F.						*	
214	Peach Pond Sweet	m.	fl.	r. s.	v. g.	F.	A.	Am.						*	
215	Peck's Pleasant	m.	r.	g. y.	v. g.	F. M.	W.	Am.	†		†	†	**		**
216	Perry Russet	m.	r. c.	rus.	g.	F. M.	W.	Am.							
217	Pewaukee	l.	fl.	r. s.	g.	F. M.	W.	Am.		*		†			
218	Phillip's Sweet	m.	r. ob.	r. s.	v. g.	F. M.	W.	Am.							
219	Pickard's Reserve	m.	r. ob.	r. y.	g.	F.	W.	Am.							
220	Pilot	l.	r. ob.	g. y. r	v. g.	F. M.	W.	Am.							
221	Pittsburg Pippin	l.	fl.	g. y.	v. g.	F. M.	W.	Am.							
222	Pleasant Valley	m.	r. ob.	g. y.	v. g.	F. M.	W.	Am.							
	Pleasant Valley Pippin.														
223	Plumb's Cider	m.	r. c.	g. y. r.	g.	K. M.	A	Am.							
224	Pomme Grise	s.	r. ob.	y. rus.	b.	F.	W.	F.	*	*			*		
225	Porter	l.	ob.	g. y.	b.	F. M.	A.	Am.	*		**	**	**	**	*
226	Premium	m.	r. c.	y.	v. g.	F. M.	E W.	Am.							
227	President	l.	r. ob.	y.	g.	F.	A.	Am.			*				
228	Primate	m.	r. c.	g. y.	b.	F.	E. A.	Am.	*		*	*		*	*
229	Progress	m.	r. ob.	y.	g.	F. M.	W.	Am.							
230	Prother's Winter	m.	c.	y. r.	g.	F. M.	L. W.	Am.							
231	Pryor's Red	l.	r. ob.	y. r.	v. g.	F. M.	W.	.....							
232	Pumpkin Sweet	l.	r. obl.	y.	g.	K. M	E. W.	Am.		*	*		*	*	
	Lyman's Pumpkin Sweet, Pound Sweet.														
233	Pyle's Winter	l.	r. ob.	r. s.	v. g.	F. M.	W	Am.							
	Pyle's Red Winter.														
234	Ramsdell's Sweet	m.	ob.	y. r.	g.	K. M.	L. A.	.....				*	*		
235	Rambo	m.	fl	y. r.	v. g.	F. M.	L. A.	Am.						*	
236	Rawle's Genet	l.	r. c.	y. r.	v. g.	F. M.	W.	.....							
237	Red Astrachan	l.	r.	y. r.	g.	K. M.	S.	F.	**	**	**	**	**	**	**
238	Red Canada	m.	r. ob.	y. r.	b.	F. M.	W.	.....				**	*		*
	Old Nonsuch, Richfield Nonsuch, Steele's Red Winter of Some.														
239	Red Cathead	l.	r. c.	y. r.	g.	F. M.	L. A.	Am.							
240	Red Crab	s.	r.	r.	....	Cider	L. A.	Am.							
241	Red Rance	m.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.							
242	Red Winter Pearmain	m.	r. ob.	y. r.	g.	F. M.	W.	Am.							
	Buncombe.														
243	Red Stripe	m.	ob. c.	y. r.	g.	K. M.	S.	Am.							
244	Rhode Island Greening	l.	r. ob.	g. y.	v. g.	F. M.	W.	Am.	*		**	**	**	**	**
245	Rhode's Orange	m.	r. ob.	y. r.	g.	F.	S.	Am.							
246	Ribston Pippin	m.	r.	y. r.	v. g.	F. M.	W.	Eng.	**	*	*		*		
247	Richard's Graft	m.	r. ob.	r. s.	v. g.	F. M.	E. A.	Am.							
248	Ridge Pippin	l.	r. c.	y. rus.	g.	M.	W.	Am.							
249	Robinson's Superb	l.	.....	.....	g.	F. M.	A.	Am.							
250	Robertson's White	m.	r. ob.	g. y.	g.	F. M.	L. A.	Am.							
251	Rock Pippin	m.	c.	y.	....	M.	W.	Am.							
	Lemon.														
252	Rockport Sweet	m.	r. ob.	g. y.	v. g.	F.	W.	Am.						*	
253	Romanite, of the South	s.	r. c.	y. r.	v. g.	F. M.	W.	Am.							
254	Roman Stem	m.	r.	y. rus.	v. g.	F. M.	W.	Am.							
255	Rome Beauty	l.	r.	y. r.	g.	M.	L. A.	Am.							
256	Roxbury Russet	m.	r. ob.	y. rus.	v. g.	F. M.	W.	Am.	*			**		**	**
257	Saint Lawrence	l.	fl.	y. r.	v. g.	M	A.	.....	**	*		*	*	*	*
258	Sarah	l.	fl.	r. s.	v. g.	F. M.	E. A.	Am.				*			
259	Saxton	m.	r. ob.	y. r.	g.	F.	A	Am.							
	Fall Stripe.														
260	Sheppard's Sweet	m.	r. c.	r. s.	g.	F.	L. A.	Am.							
261	Shiawassee Beauty	m.	fl.	r. y.	v. g.	F. M.	W.	Am.							
262	Shockley	s.	r. c.	y. r.	g.	F. M.	W.	Am.							
263	Simmons' Red	m.	ob.	y. r.	v. g.	.....	S.	Am.							
	Red Everlasting.														
264	Smith's Cider	l.	r ob.	y. r.	g.	F. M.	W.	Am.							

212 A new variety; originated in Nebraska.
217 Very hardy.
224 A tree of small growth; succeeds well at the north.
230 Valued chiefly for its keeping qualities.



240 Best of all for cider.
242 Extensively grown South and West
248 A long keeper
253 Entirely distinct from Gilpin or Shockley

Number	Names.	Description. Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	I.—N. Div.— Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.	Rhode Island.
265	Smokehouse	l.	r. ob.	y. r.	g.	K. M.	W.	Am.							
266	Somerset, of Maine	m.	fl.	r. s.	v. g.	F.	S.	Am.			*				
267	Somerset, of New York	s.	r. c.	y. rus.	v. g.	F.	E. A.	Am.							
268	Sops of Wine	m.	r.	y. r.	g.	K. M.	E. A.	Eng.		*	**	*		*	*
	Hominy.														
269	Soulard	m.	r. ob.	y. r.	g.	M.	L. A.								
270	Southern Porter	m.	r. c.	y.	v. g.	F. M.	S.	Am.							
271	Spice Russet	s.	fl. c.	y. rus.	v. g.	F.	W.	Am.							
272	Stansill	m.	r. ob.	g. y.	g.	F.	W.	Am.							
273	Stark	l.	r. c.	y. r.	g.	F.	W.	Am.	*						
274	Stevenson's Winter	m.	r. ob.	y.	g.	F.	W.	Am.							
275	Summer Bellefleur	m.	r. c.	y.	g.	F. M.	A.	Am.							
276	Summer Hagloe	l.	r. ob.	r. s.	v. g.	K. M.	S.	Am.							
277	Summer King	m.	fl.	y. r.	g.	F. M.	S.	Am.							
278	Summer Queen	l.	r. c.	y. r.	g.	K. M.	S.	Am.							*
279	Summer Pound Royal	l.	r. c.	y. rus.	g.	M.	E. A.	Am.							
280	Summer Pippin	m.	ob c.	y. r.	g.	K. M.	L. S.	Am.				*	*		
	Champlain Nyack.														
281	Summer Rose	s.	r.	y. r.	b.	F.	S.	Am.					*	*	
282	Summer Seek no further	m.	ob c.	y.	v. g.	F. M.	S.	Am.							
283	Summer Sweet Paradise	l.	r.	g. y.	v. g.	F.	E. A.	Am.			†				
284	Susan's Spice	m.	fl.	y. r.	g.	F.	A.	Am.							
285	Sutton Beauty	m.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.						*	†
286	Striped Sweet	l.	r. ob.	r. s.	v. g.	F. M.	E. W.	Am.							
	Striped Sweet Pippin.														
287	Swaar	l.	r. ob.	g. y.	b.	F. M.	W.	Am.			†				
288	Sweet Belle et Bonne	m.	r. ob.	y. rus.	v. g.	F.	E. W.	Am.							
289	Sweet Bough	l.	ob.	g. y.	v. g.	F. M.	S.	Am.	**		*	*	*	**	*
	Large Yellow Bough.														
290	Sweet Pear	m.	r. c.	y.	v. g.	F.	A.	Am.							
291	Sweet Winesap	m.	fl.	r. s.	v. g.	M.	W.	Am.							
292	Taunton	l.	r. c.	y. r.	g.	F. M.	A.	Am.							
293	Tetofsky	m.	fl. c.	y. r.	g.	K.	S.	Rus.			**	*	*		
294	Tewksbury Winter	s.	fl.	y. r.	v. g.	F. M.	W.	Am.							
	Tewksbury Winter Blush.														
295	Tillaquah	m.	r. fl.	y. r.	g.	F. M.	W.	Am.							
296	Tinmouth	m.	fl.	y. r.	v. g.	F.	W.	Am.					*		
297	Talman Sweet	m.	r.	g. y.	v. g.	K. M.	W.	Am.	*	*	**	**	**	**	*
298	Tompkins King	l.	r.	y. r.	v. g.	F. M.	W.	Am.	**		*	*	*	*	*
	King of Tompkins County.														
299	Townsend	m.	r. ob.	r. s.	g.	M.	S.	Am.							
	Hocking.														
300	Trenton Early	m.	r.	y.	g.	F.	S.	Am.							
301	Twenty Ounce	l.	r.	r. s.	v. g.	F. M.	L. A.	Am.	*		†	*	†	*	*
	Twenty Ounce Apple, Cayuga Red Streak.														
302	Utter	m.	r. ob.	r. s.	g.	F. K.	A.	Am.							
303	Vandevere	m.	fl.	y. r.	g.	M.	W.	Am.							
304	Victuals and Drink	l.	ob.	y. rus.	g.	F.	W.								
305	Virginia Greening	l.	fl.	g. y.	g.	M.	W.	Am.							
306	Wagener	m.	r. ob.	y. r.	b.	F.	W.	Am.	*		*	*	*	*	*
307	Warfield	l.	fl.	y.	g.	F. M.	A.	Am.							
308	Washington	l.	r. c.	y. r.	v. g.	F. M.	E. A.	Am.			*			**	*
	Washington Strawberry.														
309	Washington Royal	m.	r. ob.	g. y.	g.	M.	W.	Am.							
310	Water	m.	r. c.	y. r.	v. g.	F.	E. W.	Am.							
311	Waugh's Crab	s.	r. c.	r. s.	g.	Cider	W.	Am.							
312	Wealthy	m.	r. ob.	r.	v. g.	F. M.	W.	Am.	*	**			**		
313	Webb's Winter	m.	r.	y.	g.	F.	W.	Am.							
314	Wellford's Yellow	s.	r. ob.	g. y.	g.	M.	W	Am.							
315	Western Beauty	l.	r. ob.	r. s.	v. g.	F. M.	S.	Am.							
	Grosh, Summer Rambo, Etc.														
316	Westfield Seek-no-further	l.	r. c.	y. r.	b.	F. M.	W.	Am.	*				*	*	*
317	White Doctor	l.	r. ob.	g. y.	g.	K. M.	E. A.	Am.							
318	White Juneating, May, Early May, Etc.	s.	r	g. y.	g.	F. M.	S	F							

Between 42° and 49°
II. Central Division. Between 35° and 42°
III. S. Div. Bet. 28° & 35°
Number.
Connecticut.
New York.
Ontario.
Michigan
Wisconsin.
Minnesota.
Dakota.
Montana.
Wyoming
Idaho.
Washington.
Oregon
Pennsylvania.
New Jersey
Delaware.
Maryland & D.C.
Virginia
North Carolina
Ohio.
Indiana.
West Virginia
Kentucky.
Tennessee
Illinois.
Iowa
Missouri.
Nebraska
Kansas
Colorado
Utah
Nevada
California
South Carolina
Georgia
Alabama
Florida
Indian Territory
Arkansas
Mississippi
Louisiana
Texas
New Mexico
Arizona

NUMBER	NAMES.	DESCRIPTION. SIZE	FORM	COLOR	QUALITY	USE	SEASON	ORIGIN	I.—N. DIV. Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island.
319	White Paradise	m.	r. fl	y. r	g.	M	W.	Am							
	Ivy Finger														
320	White Pippin	l	r. ob.	g. y	v. g	F. M.	W.	Am.							
321	White Winter Pearmain	m.	r. c.	y. r.	v. g	F. M.	W	Am.							
322	White Rumbo	m.	r. ob.	g. y	g.	M	L. A.	Am.							
323	Williams' Favorite	m.	r. c	y. r	g.	M	S	Am.							
324	Willis Sweet	l.	r	y. r	v. g.	K. M	S	Am.							
325	Willow Twig	m.	r. c.	y. r.	g.	K. M	W	Am.							
	Wines River.														
326	Wine	l	r	y. r.	v. g.	F. M.	W	Am							
	Hag's Wine, Pennsylvania Red Stock.														
327	Winesap	m	r.	y. r	v. g	F. M	W.	Am.							
328	Winter Sweet Paradise	l	r. ob	g. y	v. g	F	W	Am							
329	Wolf River	l	r. ob	y.	g.	F. M	W.	Am							
330	Wythe	m	fl.	r. s	v. g.	F	W	Am.							
331	Yates	s.	fl	y. r.	g	F. M	W.	Am							
332	Yellow Bellefleur	l.	ob.	g. y.	v. g	F. M.	W.	Am							
333	Yellow June	m	r. ob	y	g.	F	S.	Am							
	Yantabite														
334	Yellow Transparent	m	r. ob	y	g.	.....	E. S.	Rus.							
335	York Imperial	l	fl	y. r	g.	F. M.	W.	Am.							
336	Yopp's Favorite	l	r. c.	y	g.	F.	A	Am							
337	Zachary Pippin	l	fl.	r. s.	v. g	F. M.	E. W.	Am							

II. APPLES CRABS.

NUMBER	NAME	DESCRIPTION. SIZE	FORM	COLOR	QUALITY	USE	SEASON	ORIGIN.	I. N. DIV. Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island
1	Beecher Sweet	m.	r	r	v. g	F. M	E. A.	Am.							
2	Briar Sweet (of Wisconsin)	l	.....	r. y.	v. g	F. M	A.	Am.							
3	Byer's Beauty	s.	r. fl.	r.	g.	F. M	E. A.	Am.							
4	Cherry	s.	r	y. r	g. g	K.	A.	F.							
5	Conical	m.	c.	r	v. g	F. M	L. A.	Am.							
6	Early Strawberry	m.	r.	r. s	g.	F.	S	Am							
7	Glover's Early	..	.....	.....	.....	.....	.....	Am.							
8	Hyslop	l	r.	r	g	F. M	A	Am.							
9	Lady Elgin	l.	r. ob.	y. r.	v. g.	F. M	L. A	Am.							
10	Lake Winter	l.	r.	r. y	v. g.	F.	W.	Am.							
11	Marengo	l	r. fl.	y. r	g.	F. M.	W.	Am.							
12	Minnesota	v. l.	ob.	y. r.	v. g	F. M	L. A.	Am.							
13	Montreal Beauty	l.	r. ob.	y. r.	g.	F. M	A.	Am.							
14	Orange	m.	r.	o.	g. g	F. M	L. A	Am.							
15	Orion	l.	ob.	r. s.	g. g	F. M	L. A.	Eng.							
16	Red Siberian	m.	r.	r	g	F. M	A.	F.							
17	Spitzenburg	.....	.....	.....	.....	.....	.....	Am							
18	Sweet Russet	l.	r. c	y. rus	b.	F.	E. A.	Am							
19	Sylvan Sweet	l	r. fl.	y. r.	g.	F. M	A.	Am.							
20	Transcendent	s.	r. ob.	y. r.	g.	F. M	A.	Am.							
21	Whitney	l	r. fl.	r	v. g.	M.	S.	Am.							
22	Yellow Siberian	m	r	y	g	F. M	A	F							

.25 Valuable for late keeping.

NUMBER.	Between 42° and 49°	II. CENTRAL DIVISION. Between 35° and 42°	III. S. DIV. Bet. 28° & 35°
	Connecticut.	Pennsylvania.	South Carolina.
	New York.	New Jersey.	Georgia.
	Ontario.	Delaware.	Alabama.
	Michigan.	Md. and D. C.	Florida.
	Wisconsin.	Virginia.	Indian Territory.
	Minnesota.	North Carolina.	Arkansas.
	Dakota.	Ohio.	Mississippi.
	Montana.	Indiana.	Louisiana.
	Wyoming.	West Virginia.	Texas.
	Idaho.	Kentucky.	New Mexico.
	Washington.	Tennessee.	Arizona.
	Oregon.	Illinois.	
319		Iowa.	
320		Missouri.	
321		Nebraska.	
322		Kansas.	
323		Colorado.	
324		Utah.	
325		Nevada.	
326		California.	
327			
328			
329			
330			
331			
332			
333			
334			
335			
336			
337			

II APPLES CRABS

NUMBER.	Between 42° and 49°	II.—CENTRAL DIVISION. Between 35° and 42°	III. S. DIV. 28° and 35°
1	Connecticut.	Pennsylvania.	South Carolina.
2	New York.	New Jersey.	Georgia.
3	Ontario.	Delaware.	Alabama.
4	Michigan.	Maryland & D. C.	Florida.
5	Wisconsin.	Virginia.	Indian Territory.
6	Minnesota.	North Carolina.	Arkansas.
7	Dakota.	Ohio.	Mississippi.
8	Montana.	Indiana.	Louisiana.
9	Wyoming.	West Virginia.	Texas.
10	Idaho.	Kentucky.	New Mexico.
11	Washington.	Tennessee.	Arizona.
12	Oregon.	Illinois.	
13		Iowa.	
14		Missouri.	
15		Nebraska.	
16		Kansas.	
17		Colorado.	
18		Utah.	
19		Nevada.	
20		California.	
21			
22			

III.—APRICOTS.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—r., roundish; r. f., roundish flattened; r. o., roundish oval; ob. c., oblong compressed. COLOR—y. o., yellow, shaded to deep orange in the sun; o. r., orange, with a red cheek; o., orange. QUALITY—g., good; v. g., very good; b., best. USE—All apricots being valued for the dessert, the letter F. will signify that it is extra for the dessert, and F. M. that it is valued for the dessert and at the same time profitable for market. SEASON—E., early; M., medium; L., late in season of ripening. ORIGIN—F., foreign; Am., American.

NUMBER	NAMES	DESCRIPTION							I.—N. DIV.—					
		SIZE	FORM	COLOR	QUALITY	USE	SEASON	ORIGIN	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Breda	m	r.	o.	v. g.	F. M.	E.	F.	.	.	.	.	.	.	.
2	Early Golden	s.	r. o.	o.	v. g.	F. M.	E.	Am.	.	.	.	.	.	.	.
3	Heniskirk	l.	r. f.	o. r.	b.	F. M.	M.	F.	.	.	.	.	.	.	.
4	Large Early	m.	ob. c.	o. r.	b.	F.	E.	F.	.	.	.	.	.	.	.
5	Large Red	l.	r. o.	o. r.	b.	F.	M.	F.	.	.	.	.	.	.	.
6	Moorpark	l.	r.	y. o.	b.	F. M.	L.	F.	.	.	.	.	.	.	.
7	Musch Musch	s.	r.	y.	g.	F.	E.	F.	.	.	.	.	.	.	.
8	Orange	m.	r.	o. r.	g.	F.	M.	F.	.	.	.	.	.	.	.
9	Peach	l.	r. f.	y. o.	b.	F. M.	L.	F.	.	.	.	.	.	.	.
10	Red Masculine	s.	r.	y. o.	v. g.	F. M.	M.	F.	.	.	.	.	.	.	.
11	Royal	l.	r. o.	y. r.	v. g.	F. M.	M.	F.	.	.	.	.	.	.	.
12	St. Ambroise	l.	r. f.	y. o.	b.	F.	M.	F.	.	.	.	.	.	.	.
13	Turkey	m.	r.	y. o.	v. g.	F. M.	L.	F.	.	.	.	.	.	.	.

IV.—BLACKBERRIES.

These columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. c., oblong conic; r. c., roundish conical or oval; ob. ov., oblong oval. COLOR—b., black. QUALITY—g., good; v. g., very good; b., best. USE—F. M., family and market; M., market. SEASON—M., medium; E., early; L., late. ORIGIN—Am., American; F., Foreign.

NUMBER	NAMES	DESCRIPTION							I.—N. DIV.—					
		SIZE	FORM.	COLOR	QUALITY	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Ancient Briton	l.	ob. ov.	b.	v. g.	F. M.	M.	Am.	.	.	.	.	.	*	.
2	Barnard	l.	ob. ov.	b.	v. g.	F. M.	M.	Am.	.	.	.	.	.	.	.
3	Brunton's Early	m.	.....	b.	g.	F. M.	V. E.	Am.	.	.	.	.	.	.	.
4	Dorchester	m.	ob. c.	b.	b.	M.	M.	Am.	*	.	.	.	*	**	*
5	Early Harvest	m.	ov.	b.	g.	F. M.	V. E.	Am.	.	.	.	.	.	.	.
6	Kittatinny	l.	r. c.	b.	b.	F. M.	M.	Am.	*	.	.	.	*	*	*
7	New Rochelle, or Lawton	l.	ov.	b.	g.	M.	L.	Am.	.	.	.	.	*	*	*
8	Sable Queen	.....	.....	.....	.....	.....	.....	.....	.	.	.	.	*	.	.
9	Snyder	m.	r. ov.	b.	v. g.	F. M.	E.	Am.	.	.	.	.	*	*	.
10	Stone's Hardy	l.	ob.	b.	g.	F.	.....	Am.	.	.	.	.	.	.	.
11	Taylor *Taylor's Prolific.*	l.	.....	b.	g.	F. M.	.....	Am.	.	.	.	.	*	*	.
12	Wachusett	m.	ob. ov.	b.	v. g.	F. M.	M.	Am.	.	.	.	.	.	*	†
13	Western Triumph	m.	.....	b.	g.	F. M.	.....	Am.	.	.	.	.	*	.	.
14	Wilson's Early	l.	ob. ov.	b.	v. g.	M.	E.	Am.	*	.	*	.	.	*	*
15	Wilson Junior	l.	ob. ob.	b.	v. g.	M.	E.	Am.	.	.	.	.	.	.	.

4 Of fine flavor. 6 Rusts badly in many places. 12 Almost thornless and valued on that account.

III—APRICOTS.

The columns explain as follows: SIZE—L., large; m., medium; s., small. FORM—r., roundish; r. f., roundish flattened; r. o., roundish oval; ob. c., oblong compressed. COLOR—y. o., yellow, shaded to deep orange in the sun; o. r., orange, with a red cheek; o., orange. QUALITY—g., good; v. g., very good; b., best. USE—All apricots being valued for the dessert, the letter F. will signify that it is extra for the dessert, and F. M. that it is valued for the dessert and at the same time profitable for market. SEASON—E., early; M., medium; L., late in season of ripening. ORIGIN—F., foreign; Am., American.

	Between 42° and 49°												II—CENTRAL DIVISION. Between 35° and 42°												III—S. DIV. Bet. 28° & 35°											
NUMBER.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1	..	*	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	*	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	*	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

IV—BLACKBERRIES.

The columns explain as follows: SIZE—L., large; m., medium; s., small. FORM—ob. c., oblong conic; r. c., roundish conical or oval; ob. ov., oblong oval. COLOR—b., black. QUALITY—g., good; v. g., very good; b., best. USE—F. M., family and market; M., market. SEASON—M., medium; E., early; L., late. ORIGIN—Am., American; F., foreign.

	Between 42° and 49°												II—CENTRAL DIVISION. Between 35° and 42°												III—S. DIV. 28° and 35°											
NUMBER.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1	..	*	..	..	*	*	**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	*	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..
11	*	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	†	..	..	..	..	..	..	..	..	..	..	..	..	..	..

V—CHERRIES.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. h., obtuse heart shape; r. ob. h., roundish obtuse heart shape; r. h., roundish heart shape; r. roundish, or round. COLOR—l. r., lively bright red; d. r., dark red, almost black; a. m., amber mottled with red; y. r., yellow ground shaded and marble with red. CLASS—H., Hearts, or tender fleshed sweet cherries; B., Bigarreau, or firm fleshed cherries; D., Dukes, having a character in tree and fruit midway between the Hearts and Morellos; M., Morellos, having acid fruit and the tree of small, slender growth. USE—F., family, for dessert; F. M., family or market; K. M., for cooking or market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign; Am., American.

NUMBER.	NAMES.	DESCRIPTION.							I. N. DIV.—						
		SIZE.	FORM.	COLOR.	CLASS.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.	Rhode Island.
1	Arch Duke	l.	ob. h.	d. r.	D.	K. M.	L.	F.					*		*
2	Belle Magnifique	l.	r. h.	l. r.	D.	K. M.	L.	F.			*		*		
3	Belle de Choisy	m.	r.	a. m.	D.	F.	M.	F.					*		
4	Belle d'Orleans	m.	r. h.	y. r.	H.	F. M.	E.	F.						*	*
5	Bigarreau, *Graffion, Yellow Spanish.*	l.	ob. h.	y. r.	B.	F. M.	M.	F.	**				*	*	
6	Black Eagle	l.	ob. h.	d. r.	B.	F. M.	M.	F.					*	**	*
7	Black Heart	l.	r. h.	d. r.	H.	F. M.	M.	F.	*				*	*	*
8	Black Republican, *Lueling*	l.	r. h.	b.	G.	F. M.		Am.							
9	Black Tartarian	l.	r. h.	d. r.	H.	F. M.	M.	F.	*		*		*	**	*
10	Buttner's Yellow	m.	r.	y.	G.	F. M.	L.	F.					*		
11	Carnation	m.	r.	a. m.	D.	K. M.	L.	F.							
12	Coe's Transparent	m.	r.	a. m.	H.	F.	M.	Am.			*			**	*
13	Donna Maria	m.	r.	d. r.	M.	K. M.	L.	F.							
14	Downer's Late	m.	r. h.	y. r.	H.	F. M.	L.	Am.	*					*	*
15	Early Purple, *Early Purple Guigne*	m.	r. h.	d. r.	H.	F. M.	E.	F.	*		*			*	*
16	Early Richmond	s.	r.	l. r.	M.	K. M.	E.	F.	*		*		**	*	*
17	Elton	l.	r. h.	y. r.	B.	F. M.	M.	F.			*		*	*	*
18	Eugenie, *Empress Eugenie*	m.	r. ob. h.	d. r.	D.	F. M.	M.	F.							
19	Florence	l.	h.	y. r.	B.	K. M.	L.	F.							
20	Governor Wood	l.	r. h.	y. r.	H.	F. M.	M.	Am.	*					*	*
21	Hovey	l.	r. h.	y. r.	B.	F. M.	M.	Am.						*	
22	Knight's Early, *Knight's Early Black*	l.	ob. h.	d. r.	H.	F. M.	E.	F.						*	
23	Late Duke	l.	ob. h.	d. r.	D.	K. M.	L.				*		**	*	
24	Late Kentish	m.	r.	r.	G.	K.	M.	F.					*		
25	Louis Phillippe	l.	r.	d. r.	D.	K. M.	L.	F.			*				
26	Mezel, *Bigarreau of Mezel, Monstrueuse Mezel, Bigarreau Gaubalis.*	l.	ob. h.	d. r.	B.	F. M.	M.	F.						*	
27	May Duke	l.	r. ob. h.	d. r.	D.	K. M.	E.	F.	*		*		**	*	*
28	Montmorency Large	l.	r.	d. r.	M.	K. M.	M.	F.							
29	Morello, *English Morello, Large Morello.*	l.	r. h.	d. r.	M.	K. M.	L.	F.	*		*		**		
30	Napoleon, *Royal Ann*, in California and Oregon	l.	r. ob. h.	y. r.	B.	F. M.	M.	F.			*		*		*
31	Osceola	l.	r. h.	d. r.	H.	F. M.	M.	Am.						†	
32	Ohio Beauty	l.	ob. h.	y. r.	H.	F. M.	M.	Am.						†	
33	Olivet	l.	r.	r.	D.	F.	M.	F.							
34	Plumstone Morello	l.	r.	d. r.	M.	K. M.	L.	F.							
35	Pontiac	l.	ob. h.	d. r.	H.	F. M.	M.	Am.						†	
36	Red Jacket	l.	ob. h.	y. r.	H.	F. M.	L.	Am.						**	
37	Reine Hortense	l.	r.	l. r.	D.	F. M.	L.	F.			*		*	*	
38	Rockport	l.	r. ob. h.	a. m.	B.	F. M.	E.	Am.						*	*
39	Royal Duke	l.	r.	d. r.	D.	K. M.	M.	F.							
40	Tecumseh	m.	ob. h.	d. r.	H.	M.	L.	Am.							
41	Windsor	l.	r. h.	d. r.	B.	M.	L.	Am.						*	

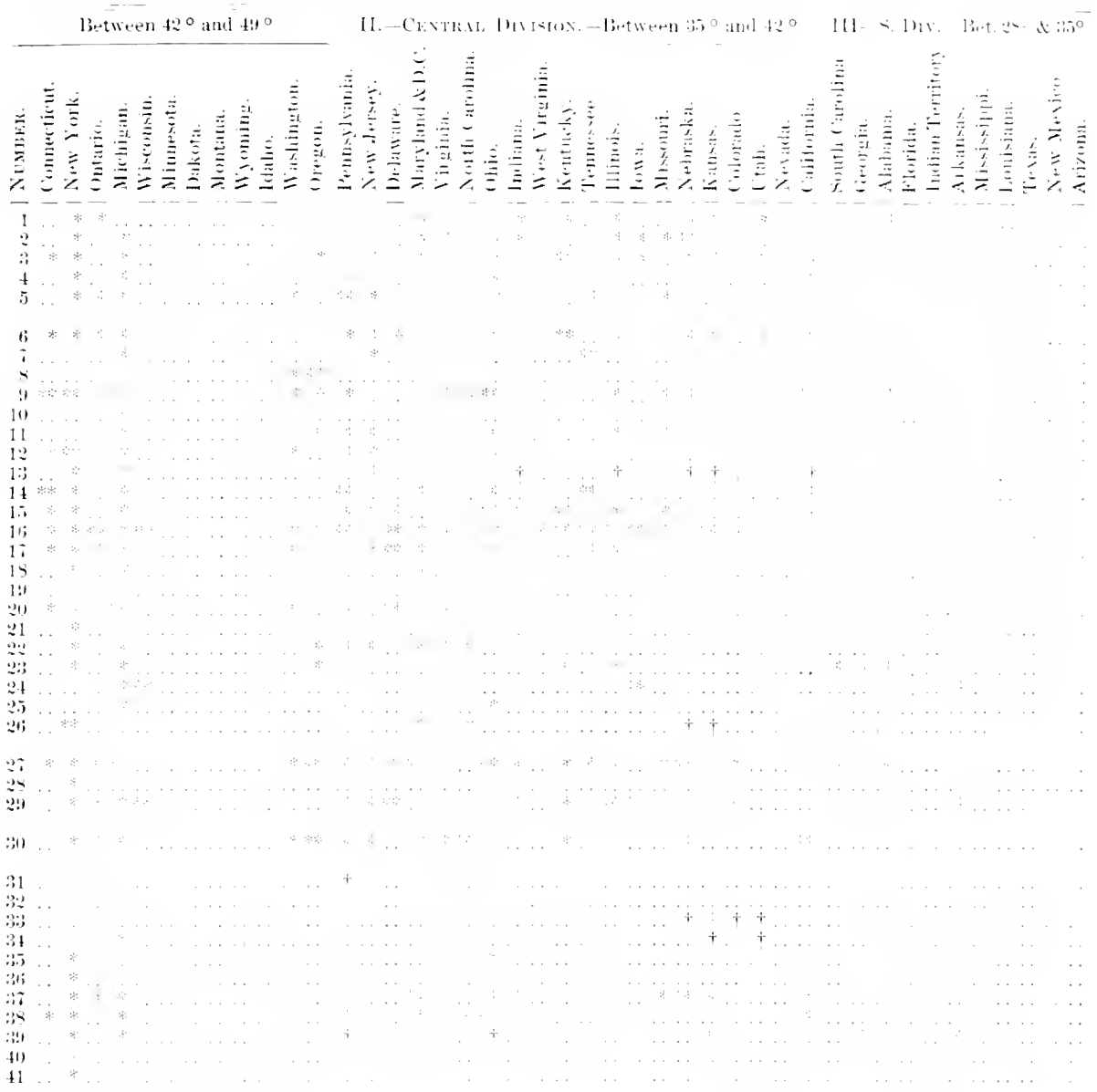
7 A fine old variety, but by many supposed to be superseded.

13 Very hardy and productive.

16 Believed by many to be identical with Early May of the West; not fully settled.

V.—CHERRIES.

The columns explain as follows: SIZE—l., large; m., medium; s., small. FORM—ob. h., obtuse heart shape; r. ob. h., roundish obtuse heart shape; r. h., roundish heart shape; r., roundish or round. COLOR—l. r., lively bright red; d. r., dark red, almost black; a. m., amber mottled with red; y. r., yellow ground shaded and marbled with red. CLASS—H., Hearts, or tender fleshed sweet cherries; B., Bigarreau, or firm fleshed cherries; D., Dukes, having a character in tree and fruit midway between the Hearts and Morellos; M., Morellos, having acid fruit and the tree of small, slender growth. USE—F., family, for dessert; F. M., family or market; K. M., for cooking or market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign. Am., American.



25 An old excellent sort; little known

36 The latest ripening large sweet cherry.

VI—CURRANTS.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—with reference to form of bunch—l., long; v. l., very long; s., short; m., medium. COLOR—r., red; b., black; w., white. QUALITY—a., acid; m. a., moderately acid; v. a., very acid. USE—K. M., kitchen and market; F. M., family and market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—Am., American; F., foreign.

NUMBER	NAMES.	DESCRIPTION. SIZE.	FORM	COLOR	QUALITY	USE	SEASON	ORIGIN	I.—N. DIV. Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island.
1	Angers, *Fertile d' Angers*	l.	l.	r.	m. a	F. M	M	F.					*		*
2	Black Naples	l.	s.	b.	m. a	K. M	M	F	*		*		*	*	*
3	Cherry	l	s.	r.	v. a	M.	M	F.	*		*	*	*	*	*
4	Common Black *Black English.*	s.	s.	b	m. a	K. M	M	F.							
5	Fay's Prolific	l	l	r	m. a	F. M.	M.	Am.						†	†
6	Knight's Red, *Knight's Large Red*	l	m.	r.	m. a.	F.	M.	F.					*		
7	Lee's Prolific	s.	l.	b.	m. a	K. M	M.	F.						*	
8	Palluau, *Fertile de Palluau*	l.	l.	r	a	F. M.	M.	F					*		
9	Prince Albert	l.	l.	r	m. a	M	L.	F.							
10	Red Dutch	m.	m.	r	m. a.	F. M.	E.	F.	*			*	*	*	*
11	Red Grape	m.	m.	r	m. a	F. M.	E.	F.							
12	Versaillaise, *La Versaillaise*	l.	s	r	a	M	M.	F.	*		*	*	*	*	*
13	Victoria *Ruby Castle.*	l	v. l	r.	a	F. M.	L.	F.					*		
14	White Dutch	m.	l.	w	m. a.	F. M.	E.	F	*				*	*	*
15	White Grape	m.	l.	w.	m. a	F. M	E.	F.	*		*		*		*

VII—GOOSEBERRIES.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., round; o., oval; r. o., roundish oval. COLOR—r., reddish, when fully ripe; g., greenish yellow, when fully ripe. QUALITY—g., good; v. g., very good; b., best. USE—K., kitchen; M., market. SEASON—E., early; M., medium; M. L., medium late. ORIGIN—Am., American; F., foreign.

NUMBER	NAMES	DESCRIPTION. SIZE.	FORM	COLOR	QUALITY.	USE	SEASON.	ORIGIN.	I.—N. DIV.— Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Crown Bob	l	o. b.	r	v. g.	K. M.	M.	F.	*				*		
2	Downing	m.	r. o.	g.	v. g.	K	M. L.	Am.							*
3	Houghton	s	r. o.	r.	g. g.	K. M	E.	Am.			*	*	*	*	
4	Mountain	l.	o	r	g. g.	M.	M.	Am					*		
5	Orange	m	r.	y.	g.	K. M	E.	Am.							
6	Pale Red *Cluster, American Seedling.*	m.	r. o.	r	v. g	K. M.	E.	Am							
7	Roaring Lion	l	o. b	r.	v. g.	K. M	M.	F	*				*		
8	Smith's, *Smith's Improved*	l.	o.	r.	v. g.	K. M.	M.	Am.			*		*	*	*
9	Whitesmith	l.	o	g.	v. g	K. M	M.	F							

2 A little liable to sunburn or blister.

4 A strong growing bush—berry with a very thick skin.

6 An old sort, entirely free from mildew—more upright than Houghton.

VI—CURRANTS.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—with reference to form of [illegible]; v. l., very long; s., short; m., medium. COLOR—r., red; b., black; w., white. QUALITY—a., acid; [illegible]; v. a., very acid. USE—K. M., kitchen and market; F. M., family and market; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—Am., American; F., foreign.

	Between 42° and 49°												II—CENTRAL DIVISION. Between 35° and 42°												III—S. DIV. Between 28° and 35°										
NUMBER.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Md. and D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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VII—GOOSEBERRIES.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., round; o., oval; r. o., roundish oval. COLOR—r., reddish, when fully ripe; g., greenish yellow, when fully ripe. QUALITY—g., good; v. g., very good; b., best. USE—K., kitchen; M., market. SEASON—E., early; M., medium; M. L., medium late. ORIGIN—Am., American; F., foreign.

	Between 42° and 49°												II.—CENTRAL DIVISION.—Between 35° and 42°												III.—S. DIV. 28° and 35°										
NUMBER.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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8. New and promising. 9. One of the best of all the foreign large sorts in its immunity from mildew.

VIII—GRAPES, NATIVE.

The columns explain as follows: SIZE with reference to the berry, l., large; m., medium; s., small. FORM with reference to bunch and berry, s. r., short bunch, round berry; l. r., large and round; m. r. o., medium bunch-roundish oval berry; m. r., medium bunch, round berry. COLOR—b., black or nearly so when fully ripe; r., reddish or coppery-brownish red; g., greenish white or yellowish. QUALITY—g., good; v. g., very good; b., best. USE. T., table; M., market; W., wine. SEASON E., early; M., medium; L., late. ORIGIN See next page.

NUMBER	NAME	DESCRIPTION.							I. N. Div.						
		SIZE	FORM	COLOR.	QUALITY	USE.	SEASON	ORIGIN.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Agawam, *Rogers' No. 15*	l	s. r. o	r	g.	T. M.	M.	Hyb.	*	*	**	*	*	*	*
2	Barry, *Rogers' No. 43*	l	r.	b.	g.	T. M	M.	Hyb			*		*	*	*
3	Brighton	l	r	dk. p. r	v. g.	T	E	Hyb				*	*	*	*
4	Catawba	l	m. r. o	r	b.	T. M. W	L.	Lab							
5	Champion	l	r	b		M	E	Lab				*			
	Eaton's Seedling														
6	Clinton	s	m. r	b.	g.	T. W	L	Rip.	*				*		
7	Concord	l	l. r	b	g.	T. M. W	M	Lab					**	*	*
8	Cottage	l	r.	b	g.	T. M	E	Lab					*	*	
9	Creveling	m	m. r. o	b.	v. g.	T	L	Lab			*	*	*	*	*
10	Cynthiana	s	r	b	v. g.	W	M	Est							
11	Delaware	s	s. r.	r	b.	T. M. W	M	Tex.					**	*	
12	Diana	m	s. r. o	r.	v. g.	T. M	L	Lab	*				*	*	*
13	Dracut Amber	l	r	r	g.	M	V. E.	Lab.							
14	Duchess	m.	m. r	w.	v. g.	T	M	Hyb						*	
15	Early Victor	m	m. r	b.	v. g.	T. M	V. E.	Lab							*
16	Elsinburg	s	m. r	b.	v. g.	T	E.	Est							
17	Elvira	s	r.	w	v. g.	W	L.	Rip. x							
18	Essex, *Rogers' No. 41*	l.	r	b.	g.	T. M	M.	Hyb.							
19	Ennedan	m	r	b.	v. g.	T	M.	Lab.			*	*			*
20	Goethe, *Rogers' No. 1*	l	l. r. o	g	v. g.	T. W	L	Hyb							
21	Hartford	l	m. r. o	b	g.	M	E	Lab.				*	*	*	*
	Hartford Prolific														
22	Herbemont	s	m. r	b.	v. g.	T. W	L	Est.							
	Worden, Etc														
23	Herbert, *Rogers' No. 11*	l	l. r.	b	v. g	T. M	M.	Hyb.							*
24	Iona	m	m. r. o	r.	b	T. M. W	L.	Lab.			*				*
25	Isabella	l.	m. r. o.	b.	g.	T. M	L.	Lab							
26	Ives	m.	m. r. o	b	g.	M. W	M	Lab.				*	*		
27	Janesville	m	r.	b.	g.	T. M	V. E	Lab							
28	Jefferson	m.	m. r.	r	v. g.	T. M	M.	Hyb.							*
29	Lady	l	r	w	g.	T. M	E.	Lab				*	*	*	
30	Lady Washington	l.	l. r. o	w	b	T. M	M.	Hyb.							
31	Lindley, *Rogers' No. 9*	m.	m. r. o	r	g.	T. M	M	Hyb					*		*
32	Massasoit, *Rogers' No. 3*	l.	m. r.	r.	g.	T. M	M.	Hyb.						*	*
33	Martha	l.	s. r	g.	g.	M. W	M.	Lab.						*	*
34	Maxatawney	m.	m. r. o.	g.	v. g	T	M.	Lab.							
35	Merrimac, *Rogers' No. 19*	l	s. r.	b	g.	M	M.	Hyb			*				*
36	Moore's Early	l	r.	b	g.	T. M	V. E.	Lab				*	*	*	*
37	Niagara	l	r.	w	g.	T. M	M	Lab.							
38	Noah	s.	r.	w	g.	W	L	Rip. x							
39	Norton's Virginia	s	m. r	b.	g.	W	L.	Est						*	
40	Perkins	l	r	r.	g.	T. M	E.	Lab.					*		
41	Peter Wylie	m.	r	w	v. g	T	.....	Hyb							
42	Pocklington	l.	l. r.	w.	g.	T. M	M.	Lab.						*	*
43	Prentiss	m	m. r	w	v. g.	T. M	M.	Lab						*	
44	Rebecca	m	s. r	g	v. g	T.	M.	Lab.							
45	Salem, *Rogers' No. 52*	l	r	b	g.	M	M.	Hyb							
46	Scuppernong	l.	r	r	g.	W.	M	Vulp							
47	Telegraph	l.	m. r. o.	b.	v. g	T. M	E.	Lab.							
	Christine														
48	Triumph	s. l.	l. r.	g	v. g.	T.	L.	Hyb							
49	Vergennes	s	l. r.	p.	v. g.	T. M.	E.	Lab						*	*
50	Walter	m.	s. r	r.	b.	T. M. W	M	Lab			*				*
51	Wilder, *Rogers' No. 4*	l.	l. r	b.	v. g.	T. M.	M	Hyb.						*	*
52	Worden	l.	r.	b	g.	T. M.	E.	Lab					*	**	*

1 A hybrid variety of great excellence.
4 Suited only to clayey loams and certain localities
5 Valued for earliness and hardiness but of a very poor quality.
6 Hardy everywhere.
7 Successful over a wider rage of soil and climate than any other variety.
9 Bunches loose.
10 17 and 38 are wine grapes of great promise in Missouri.
25 Valueless at the West.
26 Valued for dark wine
36 Resembles Concord; a little earlier.
44 The more known the better liked.

VIII.—GRAPES, NATIVE.

ORIGIN. This list contains such grapes only as are of American origin; they are either cultivated varieties of one of the following American species of native wild grapes: Vitis Riparia, Vitis Æstivalis, Vitis Labrusca, Vitis Vulpina, or crosses between varieties of those species, or hybrids between these and the Vitis Vinifera (foreign grapes). And as it is believed that the species native to any locality are best adapted to produce satisfactory results in that locality, it has been thought useful to designate in the column for origin the species to which each variety belongs, as follows:—Lab., Labrusca, native of New England; extends to South Carolina and into the Alleghany mountains. Æst., Æstivalis, native of the Middle and Southern States, on uplands. Rip., Riparia, native of Lower Canada; extends west to Nebraska, south to Texas; prefers river banks. Vulp., Vulpina, native of Southern States, not further north than Maryland, Tennessee and Arkansas. x after one of the species denotes a cross with a variety of some other species. Hyb., Hybrid, between a foreign variety and one of the native species.

I. - Between 42° and 49°

II. - Central Division.—Between 35° and 42°

III. - S. Div. Between 28° & 35°

Number.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D. C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
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11 Wants rich soil and high culture.
22 Makes the finest of white wine.
21 Unreliable except in a few locations.

29 Valuable for earliness and hardiness.
31 One of the most valuable of this class.

52 Very like Concord, but a trifle earlier and some think better.

IX—GRAPES, FOREIGN.

As the Foreign Grapes are for cultivation under glass, they are not subject to those variations induced by climate or soil, and therefore they may be regarded as equally adapted to all localities. Very few of the local committees have made any report in reference to these Grapes. The list below contains such as have been already adopted by the Society, with a few others very generally esteemed. In California, Utah and sections of the Southern States, they require no artificial protection or heat; it has, therefore, been thought unnecessary to tabulate the States and Territories relative to them; but taking the old catalogue, and simply adding to it a column relative to variety as adapted to a *cold house*, or its want of fire heat, in our Northern States, the old form is continued.

The columns explain: 1st—The COLOR of the fruit; 2d—FLAVOR; 3d—SEASON of maturity; 4th—Cold for a variety that does well without fire heat; Hot for a variety wanting fire heat. In flavor, the only distinction between those that are simply sweet, as the Chasselas or Hamburgs, and those having a distinct musky aroma, as the Muscats.

No.	NAMES.	COLOR.	FLAVOR.	SEASON.	VINERY.
1	Barbarossa ... *Prince Albert, Brizola.*	Black	Sweet ..	Very Late .	Hot ......
2	Black Champion ...	Black ...	Sweet	Early	Cold ......
3	Black Damascus ...	Black ..	Sweet ...	Late	Cold ......
4	Black Frontignan ...	Black .	Muscat	Late	Cold ......
5	Black Hamburg ...	Black . .	Sweet	Medium. ..	Cold ......
6	Black Prince ...	Black	Sweet	Medium. ..	Cold .... .
7	Black July ...	Black ...	Sweet .	Early	Cold ......
8	Bowood Muscat ...	White	Muscat	Medium. ..	Hot ....
9	Buckland Sweetwater ...	White	Sweet	Medium. ..	Cold ......
10	Calabrian, *Calabrian Raisin* ... *Raisin de Calabre*	White	Sweet ..	Late	Hot ....
11	Canon Hall Muscat ...	White	Muscat ...	Late	Hot ......
12	Chasselas Musque, or Joslin's St. Albans ... *Muscat blanc hatif, &c.*	White . ..	Muscat ...	Early	Hot ....
13	Duke of Magenta ...	Black	Sweet	Early	Hot ....
14	Golden Hamburg ... *Stockwood G. Hamburg.*	White	Sweet	Late	Hot ....
15	Golden Champion ...	Amber	Sweet	Medium. .	Hot ....
16	Grizzly Frontignan ... *Red Frontignan, Red Constantia*	Red and Yellow	Muscat	Medium. ..	Hot ....
17	Gros Colman ...	Purple	Sweet	Late	Cold ......
18	Lady Downes, *Lady Downes' Seedling* ...	Black	Sweet	Very Late .	Hot . ....
19	Muscat of Alexandria ...	White	Muscat	Late	Hot ....
20	Muscat of Hamburg ...	Black	Muscat	Medium. .	Hot ....
21	Mrs. Pince's Muscat, *Mrs. Pince's Black Muscat* ...	Black	Muscat ...	Late	Hot . . ..
22	Queen of Nice ...	White	....	......	... ...
23	Red Chasselas ... *Rose Chasselas.*	Red	Sweet	Medium. ..	Hot ....
24	Red Lombardy ...	Red	Sweet	Medium. .	Hot .. ..
25	Rio Virgin ...	....	....	....	.. ..
26	Royal Muscadine ...	White .	Sweet ...	Early	Cold ......
27	Silver Frontignan, *Early Silver Frontignan* ...	White ..	Muscat ...	Early	Hot .....
28	White Nice ...	White .	Sweet	Late	Hot . ....
29	West St. Peter's ...	Black	Sweet ..	Very Late .	Hot .....
30	Wilmot's Hamburg ... *Dutch Hamburg, Wilmot's Black Hamburg.*	Black	Sweet ...	Medium.	Hot ....
31	White Sweetwater ... *Dutch Sweetwater, etc.*	White	Sweet	Early ...	Cold ......
32	White Frontignan ... *White Constantia, Muscat blanc*	White ..	Muscat	Medium. ..	Hot ....
33	Zinfindal	Black . .	Sweet	Medium. .	Hot . . .

XI—NECTARINES.

Explanation same as for Apricots.

Number	NAMES	DESCRIPTION. Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	I. N. Div.— New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Boston ...	l.	r. o.	o. r.	v. g.	F.	M	Am.	..						
2	Downton ...	l.	r. o.	o. r.	v. g.	F.	E	F.	..						
3	Early Newington ...	l	r. o.	o. r.	v. g.	F.	E.	Am.	..						
4	Early Violet ...	l.	r.	o. r.	b.	F.	E.	F.	..						
5	Elruge ...	m.	r. o.	o. r.	v. g.	F.	L	F.	..						
6	Stanwick ...	l	r. o	o. r.	g.	F.	L	F.	..						

X.—MULBERRIES—FIGS—POMEGRANATES.

The following list of mulberries, figs, and pomegranates was prepared by Mr. P. J. Berckmans, of Georgia. In California and many sections of the Southern States, the figs and pomegranates are grown as readily as the apple in the Middle States.

No.	NAMES.	SEASON.	COLOR.	QUALITY.	SIZE.
	MULBERRIES				
1	Hick's Everbearing	Early and Late.	Black	Second	
2	Downing	Early	Black	First	
3	Persian Black	Late	Black	First	
4	Johnson	Medium	Black	First	
	FIGS				
1	Alicante	Medium	Brown	First	Medium
2	Angelique *Jaune Hative*	Early	Yellow	Second	Small
3	Brunswick *Madonna, Constantinople*	Early	Violet	First	Very Large
4	Blue Genoa	Early	Blue	First	Medium
5	Black Ischia	Medium	Black	First	Medium
6	Brown Smyrna	Medium	Brown	First	Medium
7	Celestial	Early	Pale Violet	First	Small
8	Green Ischia *White Ischia. Green Italian.*	Early	Green	First	Medium
9	Jaune Hative (see Angelique)				
10	Lemon	Early	Yellow	First	Medium
11	Violet, long	Medium	Violet	First	Large
12	Violet, round	Medium	Violet	Second	Medium
13	Nerii	Late	White	First	Small
14	Pregussata	Medium	Purple	First	Small
15	White Marseilles	Medium	White	Second	Medium
16	White Genoa	Medium	White	Second	Large
17	Superfine de la Sausaye	Late	Brown	First	Medium
18	Turkey *Brown Turkey.*	Early to Late	Brown	First	Large
	POMEGRANATES				
1	Sweet	Early	Reddish	First	Large
2	Acid	Early	Deep Red	Third	Very Large
3	Violet	Late	Violet	First	Very Large
4	Dwarf	Late	Red	Second	Small

Mulberries. No. 1 bears three months. No. 2 Best. No. 3 Very tart.

XI—NECTARINES.

Explanation same as for Apricots.

	I.—Between 42° and 49°										II.—Central Division. Between 35° and 42°														III.—S. Div. 28° and 35°									
Number.	Connecticut.	New York.	Ontario.	Michigan.	Wisconsin.	Minnesota.	Dakota.	Montana.	Wyoming.	Idaho.	Washington.	Oregon.	Pennsylvania.	New Jersey.	Delaware.	Maryland & D.C.	Virginia.	North Carolina.	Ohio.	Indiana.	West Virginia.	Kentucky.	Tennessee.	Illinois.	Iowa.	Missouri.	Nebraska.	Kansas.	Colorado.	Utah.	Nevada.	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
1		*														*																										
2		*																																							
3		*		*																																					
4		*		*																																					
5		*											*																												
6		*																																							

XII—ORANGES AND LEMONS.

THE FOLLOWING LIST WAS PREPARED BY MR. L. H. HART, OF FLORIDA.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—ov., oval; r., round; fl., flattened; obl., oblong. QUALITY—f., fair; g., good; v. g., very good; b., best. SEASON—E., early; M., medium; L., late. ORIGIN—F., foreign; N., native.

		DESCRIPTION.					I.—N. Div.—Bet. 42° and 49°	II.—Cent. Div. Bet. 35° and 42°	III.—South Div. Between 28° and 35°											
Number	Names	Size	Form	Quality	Season	Origin			California	South Carolina	Georgia	Alabama	Florida	Indian Territory	Arkansas	Mississippi	Louisiana	Texas	New Mexico	Arizona
1	Acapulo	l	r	g	M	F														
2	Acis	l	r	g	L	F														
3	Bell	l.	ov.	g	M	F										*	*			
4	Botelha	m.	r	g	M	F														
5	Brown					F														
6	Buttercount					F											*			
7	Charley Brown	l	fl	g	M	[illegible]														
8	Cleopatra																			
9	Dancy's Tangierine	s	fl	g.	L	N														
10	Dulcissima	s	r	v. g	L	[illegible]											*			
11	Du Roi	m.	r	g.	M	F							*			*				
12	Egg	m	o. v	g	E	F										*	*			
13	Excelsior	m.	r	v. g	L	F							*			*	*			
14	Exquisite	m	r	v. g.	M	F										*	*			
15	Grape Fruit (pumelos)															*				
16	Hart's Late or Tardive	m	o. v	v. g	L.	F										*	*			
17	Hamosassa	m.	r	b.	M.	N										*				
18	Jaffa	m	r	v. g	M	F										*	*			
19	Kumquat (for preserving)		obl. r			N										*	*			
20	Long					F.										*	*			
21	Magnum Bonum	l	r	b	M	N										*	*			
22	Majorca	m.	r	v. g.	M	F										*	*			
23	Maltese Blood	s	o. v	v. g.	M	F							*			*	*			
24	Maltese Oval	l	obl.	v. g.	L	F							*			*	*			
25	Mediterranean Sweet	l.	o. v.	v. g.	L.	F										*	*			
26	Nonpareil	l	r	b.	E	N.							*			*	*			
27	Old Vini	m	r	v. g	M	N										*	*			
28	Paper Rind					F										*	*			
	St. Michael!																			
29	Prata	s.	r	g	M.	F.										*	*			
30	Queen					F										*	*			
31	St. Michaels	m.	r	g	M	F										*	*			
32	St. Michaels	s	fl	g.	E.	F.										*	*			
33	St. Michael's Egg	l	o. v	f.	E.	F							*			*	*			
34	Satsuma	m.	fl	v. g	E	F							*			*	*			
35	Shaddock Blood												*			*	*			
36	Shaddock Orange															*	*			
37	Sustain	l	r	g.	M.	F.							*			*	*			
38	Sweet Seville	s.	o. v	v. g.	E.	F							*			*	*			
39	Tahiti	l	r	g.	M.	F.							*			*	*			
40	White	l		g		F							*			*	*			
	LEMONS.																			
41	Bijou					F										*	*			
42	Eureka					F							*			*	*			
43	Everbearing					F							*			*	*			
44	French's Seedling					N							*			*	*			
45	Genoa					F							*			*	*			
46	Imperial					F							*			*	*			
47	Lamb					N							*			*	*			
47	Sicily					F							*			*	*			
49	Villa Francha					F							*			*	*			
50	Willow Leaved					F							*			*	*			

The following are native varieties of the orange resembling each other, of good quality, and having a local reputation: Arcadia, Beache's 3, Dixon, Dummitt, Higgins, Osceola, Parson Brown, Peerless, Spratt's Harmon. Nos. 8, 9, 32 and 34 are varieties of Citrus Nobilis or Mandarin orange.

XII CONTINUED—LIMES AND CITRONS.

THE FOLLOWING LIST WAS PREPARED BY MR. E. H. HART, OF FLORIDA

NUMBER.	NAMES	DESCRIPTION: SIZE.	FORM.	QUALITY.	SEASON.	ORIGIN.	I—N. DIV.—Bet. 42° and 49°	II CENT. DIV. Bet. 35° and 42°	III SOUTH DIV.—Between 28° and 35°	California.	South Carolina.	Georgia.	Alabama.	Florida.	Indian Territory.	Arkansas.	Mississippi.	Louisiana.	Texas.	New Mexico.	Arizona.
	LIMES																				
51	Dulcis																				
52	Mexican																				
53	Persian																				
	CITRONS																				
54	Medica (Lemon or Citron of Commerce)																				
55	Tuberosa (Orange Citron)																				

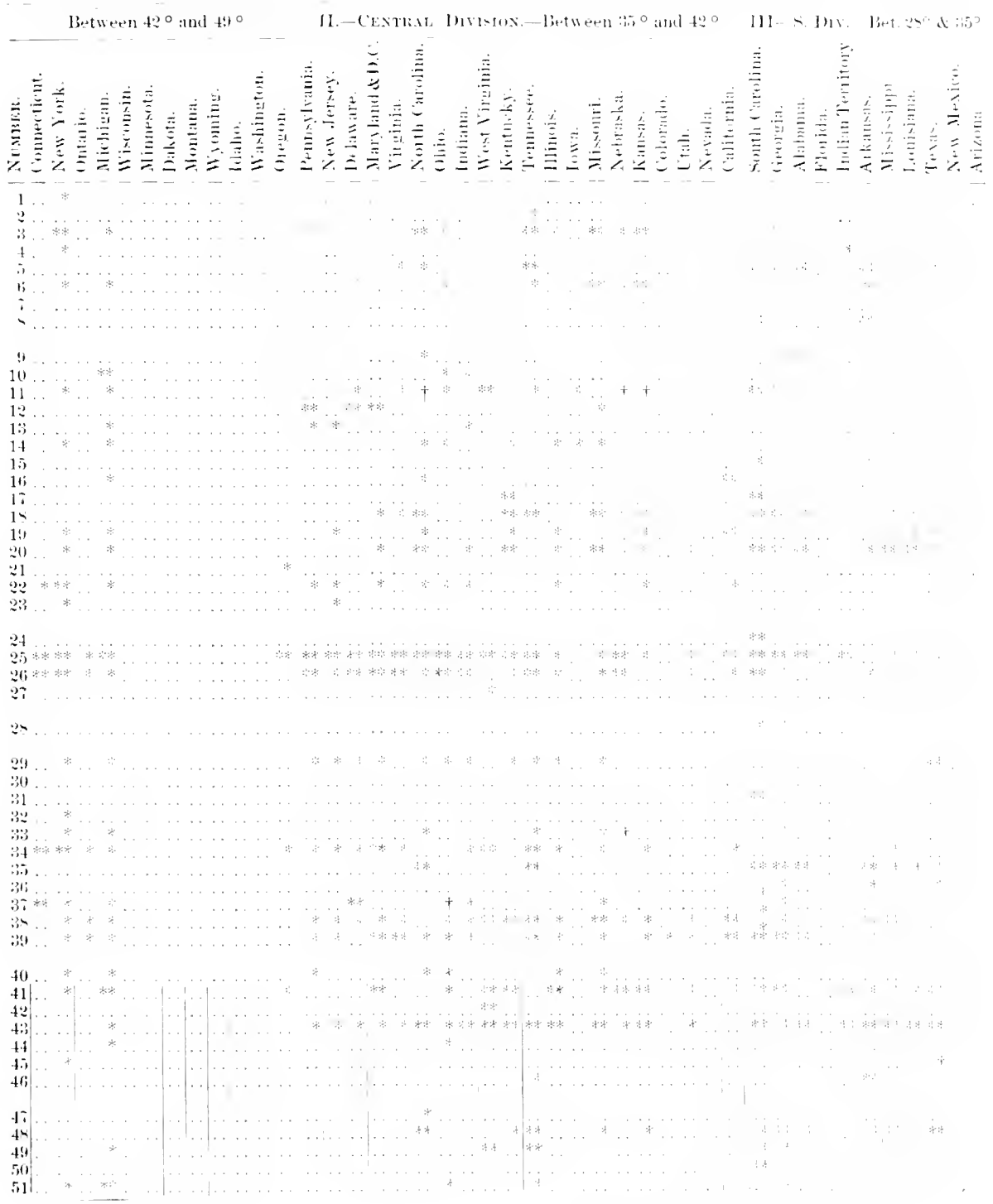
XIII—PEACHES.

The columns explain: SIZE—l., large; m., medium; s., small. CLASS—F., freestone; C., clingstone. COLOR—relative to the flesh, w., white or pale color; y., yellow or yellowish; g., greenish white, red at stone. QUALITY—j. v., juicy, vinous; m. j. r., melting, juicy, rich; s. j., sweet, juicy; s. j. h., sweet, juicy and high flavored. GLANDS—s., serrated, without glands; g., glands, globose; r., glands, reniform. SEASON—the season of maturity, as Early, Medium or Late; those designated as Early, ripen in lat. 43° previous to or about Sept. 1st; Medium, those ripening from 1st to 15th of September; and Late those after that period; a few of the Very Early and Very Late are so designated—E., early; M., medium; L., late; V. E., very early; V. L., very late. ORIGIN—Am., American; F., Foreign.

NUMBER	NAMES.	DESCRIPTION.							I.—N. DIV.						
		SIZE.	CLASS.	COLOR.	QUALITY.	GLANDS.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island.
1	Albert, *Early Albert*	m.	F.	w.	m. j. r.	r.	E.	F.							
2	Allen's October	...	...	...	...	...	L.	Am.							
3	Alexander	m.	F.	w.	s. j.	g.	V. E.	Am.							†
4	Alexandra Noblesse	l.	F.	w.	m. j. v.	g.	M.	F.							
5	Amelia	l.	F.	w.	m. j. r.	r.	E.	Am.							
6	Amsden, *Amsden's June*	m.	F.	w.	s. j.	g.	V. E.	Am.							†
7	Ashby's Early	...	...	...	...	...	...	...	...	...	...	...	...	...	
8	Austin's Late *Austin's Late Red.*	l.	C.	w.	j. v.	r.	L.	Am.							
9	Baldwin's Late	l.	F.	w.	j. m.	r.	L.	Am.							
10	Barnard	m.	F.	y.	j. v.	g.	E.	...	...	...	...	...	...	...	
11	Beatrice, *Early Beatrice*	s.	F.	w.	m. j.	r.	V. E.	F.	...	...	...	...	...	...	
12	Beer's Smock	l.	F.	y.	j. v.	...	L.	Am.							
13	Bellegarde	l.	F.	g.	s. j.	g.	M.	F.	...	...	...	...	...	...	
14	Bergen's Yellow	m.	F.	y.	j. v.	r.	M.	Am.	...	...	...	...	...	...	
15	Bordeaux	l.	C.	y.	j.	r.	E.	Am.							
16	Briggs' May	m.	F.	w.	m.	....	V. E.	Am.	...	...	...	...	...	...	
17	Catharine	l.	C.	y. g.	j. r.	r.	M.	Am.							
18	Chinese Cling	l.	C.	g.	j. v.	r.	M.	...	...	...	...	...	...	...	
19	Cole's Early, *Cole's Early Red*	m.	F.	w.	m. j. r.	g.	V. E.	Am.							
20	Columbia	l.	F.	y.	j. v.	r.	M.	Am.							
21	Conner's Cling	...	...	...	...	...	...	...	...	...	...	...	...	...	
22	Coolidge's Favorite	l.	F.	w.	s. j. h.	g.	M.	Am.							
23	Cook's Late *Cook's Late White.*	m.	F.	w.	m. j. v.	....	L.	Am.							
24	Counts	l.	C.	w.	m. j.	....	M.	Am.							
25	Crawford's Early	l.	F.	y.	j. v.	g.	M.	Am.							
26	Crawford's Late	l.	F.	y.	j. v.	g.	L.	Am.	...	...	...	...	...	...	
27	Crockett's Late *Crockett's Late White*	m.	F.	w.	s.	r.	L.	Am.							
28	Deming's Orange *Deming's Sept.*	l.	C.	y.	j. r.	....	L.	Am.							
29	Druid Hill	l.	F.	g.	m. j. r.	g.	V. L.	Am.							
30	Duff Yellow	l.	C.	y.	m. j.	g.	E.	Am.							
31	Early Admirable	l.	F.	w.	m. j.	g.	M.	F.							
32	Early Grosse Mignonne	m.	F.	w.	m. j. v.	g.	E.	F.							
33	Early Newington Free	l.	F.	g.	j. v.	g.	E.	Am.	...	...	...	...	...	...	
34	Early York	m.	F.	w.	m. j. r.	s.	V. E.	Am.	...	...	...	...	...	...	
35	Eaton's Golden	m.	C.	y.	s. j.	r.	L.	Am.	...	...	...	...	...	...	
36	Elewellen	l.	C.	y.	j. r.	....	E.	Am.	...	...	...	...	...	...	
37	Foster	l.	F.	y.	j. v.	g.	L.	Am.							†
38	George the Fourth	m.	F.	y.	m. j. r.	g.	M.	Am.							†
39	Grosse Mignonne *Royal Kensington.*	l.	F.	w.	s. j. h.	g.	M.	F.	...	...	...	...	...	...	
40	Haine's Early	m.	F.	g.	s. j.	g.	V. E.	Am.							
41	Hale's Early	m.	F.	w.	m. j. r.	g.	V. E.	Am.							
42	Harker, *Harker's Seedling*	l.	F.	y.	s. j.	g.	M.	Am.	...	...	...	...	...	...	
43	Heath Cling	l.	C.	g.	s. j. h.	r.	V. L.	Am.	...	...	...	...	...	...	
44	Hill's Chili	m.	F.	y.	...	...	L.	Am.	...	...	...	...	...	...	
45	Honeywell	m.	F.	w.	s. j.	....	E.	Am.							
46	Hoover's Heath *Hoover's Late Heath.*	...	...	...	...	...	...	...	...	...	...	...	...	...	
47	Hyslop Cling	l.	C.	w.	m. j. r.	r.	V. L.	Am.	...	...	...	...	...	...	
48	Indian Blood Cling	l.	C.	y.	j. v.	r.	L.	Am.	...	...	...	...	...	...	
49	Indian Blood Freestone	l.	F.	...	...	...	...	Am.	...	...	...	...	...	...	
50	Incomparable	l.	C.	w.	m. j.	r.	L.	Am.	...	...	...	...	...	...	
51	Jacques	l.	F.	y.	j. v.	r.	M.	Am.							

XIII—PEACHES.

The columns explain: SIZE—l., large; m., medium; s., small. CLASS F., freestone; C., clingstone. COLOR—relative to the flesh, w., white or pale color; y., yellow or yellowish; g., greenish white, red at stone. QUALITY—j. v., juicy, vinous; m. j. r., melting, juicy, rich; s. j., sweet, juicy; s. j. h., sweet, juicy and high flavored. GLANDS—s., serrated, without glands; g., glands, globose; r., glands, reniform. SEASON—the season of maturity, as Early, Medium or Late; those designated as Early, ripen in lat. 43° previous to or about Sept. 1st; Medium, those ripening from 1st to 15th of September; and Late those after that period; a few of the Very Early and Very Late are so designated—E., early; M., medium; L., late; V. E., very early; V. L., very late. ORIGIN—Am., American; F., Foreign.



5 This originated in South Carolina and differs from the Missouri Amelia.

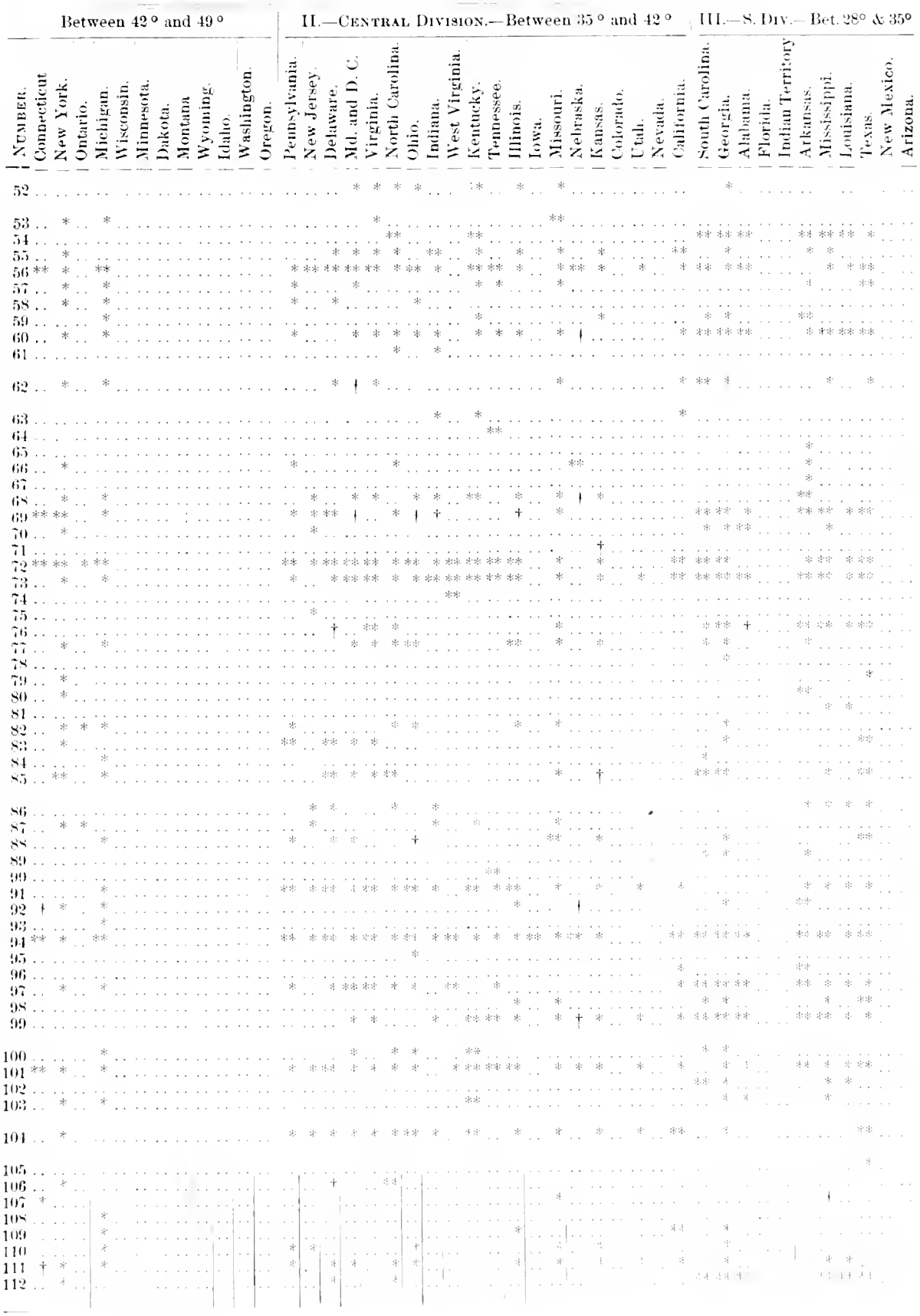
18 Berckmans thinks it is the same as Shanghae

28 Resembles Lemon Cling

Number	NAMES.	DESCRIPTION.							I.—N. Div.—						
		Size.	Class.	Color.	Quality.	Glands.	Season.	Origin.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
52	Kenrick's Heath	l.	F.	g.	j. v.	r.	L.	Am.							
	Heath Freestone.														
53	Keyport White	l.	F.	w. r.	m. j.	r.	V. L.	Am.							†
54	Lady Parham	m.	F.	g	j. v.	r.	V. L.	Am.							
55	La Grange	l.	F.	w.	s. j. h.	r.	V. L.	Am.							
56	Large Early York	m.	F.	w.	s. j. h.	g.	V. E.	Am.							†
57	Large White Cling	l.	C.	w.	s. j.	g.	L.	Am.							
58	Late Red Rareripe	l.	F.	w.	s. j. h.	g.	M.	Am.							*
59	Late Admirable	v. l.	F	y. g.	m. h.	g.	M.	F.							
60	Lemon Cling	l.	C.	y.	j. v.	r.	L.	Am.							
61	Leopold I.	l.	F.	y.	j. v.	r.	M.	F.							
	Leopold Freestone.														
62	Louise	m.	F.	w.	m. j.	r.	E.	Eng.							
	Early Louise.														
63	Malta	l	F.	g.	m. j. r.	s.	M.	F							
64	Mammoth Freestone	v. l.	F.												
65	Mitchell's Mammoth	l.	C.	g. w.	m. j.		L.	Am.							
66	Molden's White	l.	F.	w.	s. j.	r.	L.	Am.							
67	Montgomery's Late	l.	F.	w. r.	m. j.	r.	L.	Am.							
68	Morris' White	m.	F.	w.	m. j. r.	r.	M.	Am.						*	
69	Mountain Rose	m.	F	w.	s. j.	g.	M.	Am.						†	†
70	Noblesse	l.	F.	w.	s. j.	s.	M.	F.							
71	Nugent's Juicie	m.	C.	y. r.			V. E.	Am.							
72	Oldmixon Free	l.	F.	g.	s. j. h.	g.	M.	Am.						**	**
73	Oldmixon Cling	l.	C	w.	m. j. r.	g.	M.	Am.						*	
74	Pavie de Pompone	l.	C	w.	m. j.	r.	L.	F.							
75	Petite Imperial	l	F	w.	m. j. v.	r.	L.	Am.							
76	Picquett's Late	l.	F	y.	s. j.	r.	M.	Am.							
77	President	l.	F.	w.	m. j. r.	g.	M.	Am.						*	
78	Prince of Wales	l	F	w.	m. j.	r.	M.	F							
79	Princess of Wales	l.	F.	w.	m. j. v.	g.	M.	F.							
80	Pucel le de Malines	l.	F.	w. r.	m. j.	s.	M.	Am.							
81	Raymond Cling	l.	C.												
82	Red Cheek Melocoton	l.	F.	y.	j. v.	g.	M.	Am.						*	
83	Reeves' Favorite	l.	F.	y. r.	m. j.	g.	M.	Am.							
84	Richmond	m.	F.	w.	m. j.	r.	M.	Am.							
85	Rivers	l.	F.	p. y.	m. r.	r.	E.	Eng.							
	Early Rivers.														
86	Rodman's Cling	l.	C.	w.	j. v.	r.	L.	Am.							
87	Royal George	m.	F.	w.	m. j. r.	s.	E.	F.							*
88	Salway	l	F.	y. r.	m. j.	r.	M.	Am							
89	Scott's October	m.	C.	y.			V. L.								
90	Shockley's Early														
91	Smock	l.	F.	y.	j. v.	r.	L.	Am.							
92	Snow	m.	F.	w.	s. j.	r.	M.	Am.							
93	Snow's Orange	m.	F.	y.	m. j.	r.	M.	Am.							
94	Stump the World	l.	F.	w.	s. j. h.	g.	L.	Am.							*
95	Strutevant	m.	F.	y.	s. j. h.	g.	M.	Am.							
96	Strawberry	m.	F.	w.	m. h.	r.	M.	Am.							
97	Susquehanna	l.	F.	y.	s. j. v.	g.	M.	Am.							
98	Thurber	l	F.	w.	m. j. r.		E.	Am.							
99	Tillotson	l.	F.	g.	m. j. r.	s.	V. E.	Am.							*
	Early Tillotson.														
100	Tippecanoe	l	C.	y.	j. v.	r.	L.	Am.							
101	Troth's Early	m.	F.	w	s. j.	g.	E.	Am.							*
102	Tuskena Cling, *Lemon*														
103	Van Zandt	m.	F.	w.	m. j. r.	g.	M.	Am.							
	Van Zandt's Superb.														
104	Ward's Late	l.	F.	w.	r. j. s.	r.	L	Am.							†
	Ward's Late Free.														
105	Washington Cling	m.	C.	y. r.	m. j.	r.	L.	Am.							
106	Waterloo	l-m.	F.	w.	s. j.	g.	V. E.	Am.							
107	Wheatland	l.	F	y.	s. j. h.	r.	M.	Am.							
108	Wheeler's Early	s.	F.	w. r.	m. j.		V. E.	Am.							
109	White Imperial	m.	F.	w.	m. j. r.	g.	E.	Am.							
110	Yellow Alberge	m	F.	y.	s. j	g.	E.	F.						*	
111	Yellow Rareripe	l.	F.	y.	j. v.	g.	E.	Am.						*	
112	Yellow St. John	l.	F.	y.	s. j.	g.	V. E.	Am.							
	Fleita's, Flater's St. John.														

65 Resembles Heath Cling, but later

105 One of the earliest.


Between 42° and 49°
II.—Central Division.—Between 35° and 42°
III.—S. Div.—Bet. 28° & 35°
Number.
Connecticut
New York.
Ontario.
Michigan.
Wisconsin.
Minnesota.
Dakota.
Montana
Wyoming.
Idaho.
Washington.
Oregon.
Pennsylvania.
New Jersey.
Delaware.
Md. and D. C.
Virginia.
North Carolina.
Ohio.
Indiana.
West Virginia.
Kentucky.
Tennessee.
Illinois.
Iowa.
Missouri.
Nebraska.
Kansas.
Colorado.
Utah.
Nevada.
California.
South Carolina.
Georgia.
Alabama.
Florida.
Indian Territory
Arkansas.
Mississippi.
Louisiana.
Texas.
New Mexico.
Arizona.

XIV—PEARS.

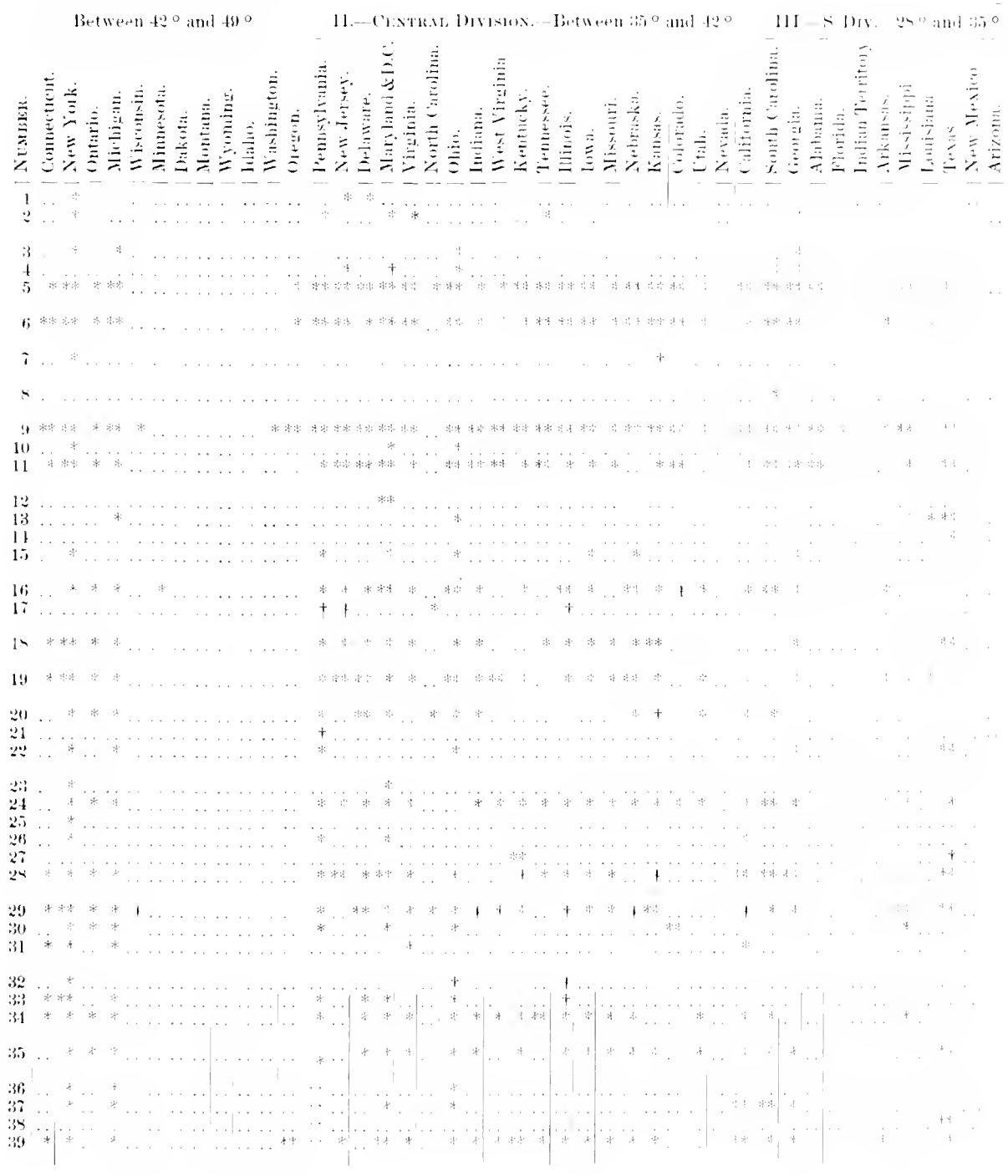
The columns explain as follows: SIZE—s., small; l., large; m., medium. FORM—p., pyriform; r. o. p., roundish obtuse pyriform; r. a. p., roundish acute pyriform; ob. p., obtuse pyrform; ob. o. p., oblong obtuse pyriform; r., roundish; r. ob., roundish obtuse. COLOR—y. g., yellow or yellowish green with a red or russet red cheek; y. r., yellow and russet; y., when mostly yellow or yellowish. QUALITY—g., good; v. g., very good; b., best. USE—F., valuable family dessert; K. M., kitchen and market; F. M., family and market. SEASON—S. summer; L. S., late summer; A., autumn; E. A., early autumn; L. A., late autumn; W., winter. ORIGIN—Eng., English; Am., American; F., French; Fl., Flemish; B., Belgium; H., Holland.

NUMBER	NAME.	DESCRIPTION.							I. N. DIV.						
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.	Rhode Island.
1	Abbott	m.	ob. p.	y. r.	v. g.	F.	E. A.	Am.				†		*	*
2	Amanlis	l.	r. o. p.	y. g.	g.	M.	E. A.	B.					*		
	Beurre d'Amanlis.														
3	Ananas d'Ete	l.	p.	y. g.	v. g.	F. M.	E. A.	H.					*		
4	Andrews	l.	p.	y. g.	v. g.	F.	E. A.	Am.	†			†		*	
5	Angoulemc	l.	o. b. o. p.	y.	v. g.	F. M.	A.	F.	*			*		**	**
	Duchesse d'Angoulemc.														
6	Anjou	l.	ob. p.	y. g.	v. g.	F. M.	L. A.	F.	*			**	**	**	**
	Beurre d'Anjou.														
7	Ansault	m.	ob. p.	y. r.	b.	F.	L. S.	F.							
	Bonne du Puits Ansault.														
8	Bachman							Am.							
	Dr. Bachman (local.)														
9	Bartlett	l.	o. b. o. p.	y.	v. g.	F. M.	L. S.	Eng.	**			*	*	**	**
10	Baronne de Mello	m.	r. a. p.	y. r.	v. g.	F. M.	E. A.	B.						*	
11	Belle Lucrative	m.	r. o. p.	y. g.	b.	F.	E. A.	Fl.			**	*	*	*	**
	Fondante d'Automne.														
12	Bergen	s.	p. y. r.	y. g.	g.	F. M.	E. A.	Am.							
13	Beurre Goubault	m.	ob. t.	g. y.	g.	F.	L. S.	F.							
14	Beurre Precoce	m.	ob. p.	y. r.	g.	F. M.	S.	F.							
15	Bilboa	m.	p.	y.	v. g.	F.	E. A.		*					*	
	Golden Beurre of Bilboa.														
16	Bloodgood	m.	t.	y. r.	v. g.	F.	S.	Am.			*	*	*	*	*
17	Bordeaux	m.	r.	y. r.	g.	M.	W.	F.						†	
	Duchesse de Bordeaux.														
18	Bosc	l.	p.	y. r.	b.	F. M.	L. A.	B.	*		*	*	*	**	*
	Beurre Bosc.														
19	Boussock	l.	r. o. p.	y. r.	v. g.	F. M.	E. A.	B.	†			*		**	*
	Doyenne Boussock.														
20	Brandywine	m.	r. ob.	y. g.	v. g.	F. M.	S.	Am.	*			*		**	
21	Brialmont	l.	ob. p.	y. r.	v. g.	F. M.	A.	B.						*	
22	Brignais	m.	r. ob.	y.	v. g.	F.	E. A.							*	*
	Beurre de Brignais, Des Nonnes.														
23	British Queen	l.	ob. p.	y. r.	v. g.	F. M.	A.	Eng.							
24	Buffum	m.	r. o. p.	y. g.	g.	M.	E. A.	Am.			*	*	*	*	*
25	Caen de France	m.	ob. p.	y. r.	v. g.	F. M.	W.	F.						*	
26	Catillac	l.	r. a. p.	y.	g.	K. M.	W.	F.						*	
27	Chambers	m.	ob. p.	y.	g.	F. M.	S.	Am.							
28	Clairgeau	l.	p.	y. r.	g.	M.	L. A.	F.	*		*		*	*	*
	Beurre Clairgeau.														
29	Clapp's Favorite	l.	o. b. o. p.	y. g.	v. g.	F. M.	S.	Am.	*		**	*	*	**	*
30	Columbia	l.	r. o. p.	y.	g.	M. K.	W.	Am.						*	*
31	Comice	l.	r. o. p.	y. g.	b.	F. M.	L. A.	F.						**	**
	Doyenne du Comice.														
32	Dallas	l.	ob. p.	y. g.	v. g.	F. M.	L. A.	Am.						*	
33	Dana's Hovey	s.	r. ob. p.	y. g.	b.	F.	W.	Am.					*	**	**
34	Dearborn	s.	r. p.	y.	v. g.	F.	S.	Am.			*	*		*	*
	Dearborn's Seedling.														
35	Diel	l.	r. ob. p.	y. r.	v. g.	F. M.	L. A.	B.	*		*		*		
	Beurre Diel.														
36	Dix	l.	ob. p.	y.	b.	F. M.	L. A.	Am.							
37	Doyenne d'Alencon	m.	r. p.	y. r.	v. g.	F. M.	W.							*	
38	Duchess Precoce	l.	p. y. r.	y. g.	g.	F. M.	E. A.	F.							
39	Easter Beurre	l.	r. ob. p.	y. r.	v. g.	F.	W.	B.					*		

11 Not profitable for market

XIV—PEARS.

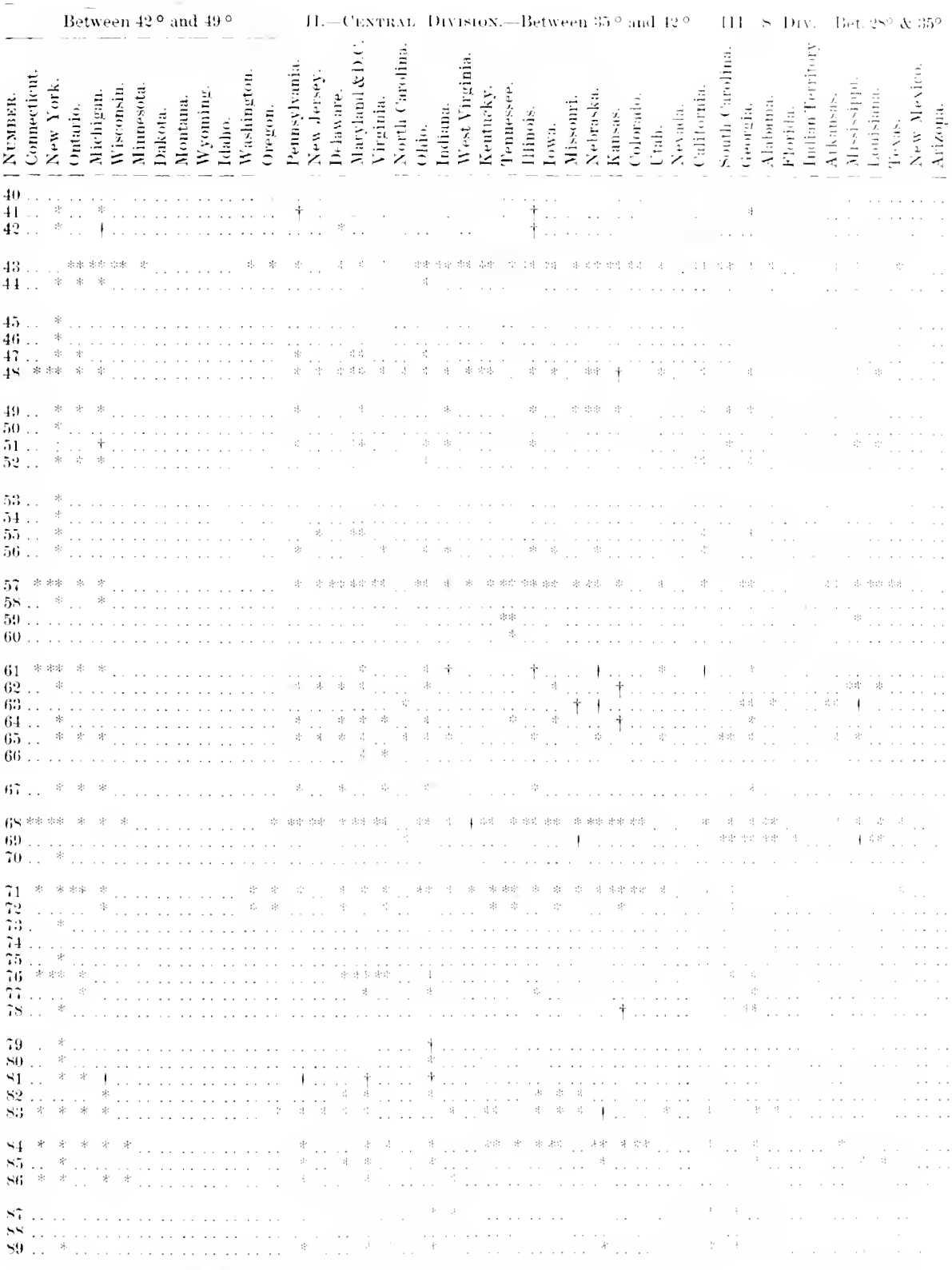
The columns explain as follows: Size—s., small; l., large; m., medium. Form—p., pyriform; r. o. p., roundish obtuse pyriform; r. a. p., roundish acute pyriform; ob. p., obtuse pyriform; ob. o. p., oblong obtuse pyriform; r., roundish; r. ob., roundish obtuse. Color—y. g., yellow or yellowish green with a red or russet red cheek; y. r., yellow and russet; y., when mostly yellow or yellowish. Quality—g., good; v. g., very good; b., best. Use: F., valuable family dessert; K. M., kitchen and market; F. M., family and market. Season—S., summer; L. S., late summer; A., autumn; E. A., early autumn; L. A., late autumn; W., winter. Origin—Eng., English; Am., American; F., French; Fl., Flemish; B., Belgium; H., Holland.



39 Requires very high cultivation.

Number	NAMES.	DESCRIPTION						I. N. Div.						
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick.	Maine.	New Hampshire.	Vermont.	Massachusetts.	Rhode Island.
40	Eastern Belle	m.	ob. p.	y. r.	g.	F.	E. A.	Am.			*			*	
41	Emile d'Heyst	l.	ob. p.	y. r.	b.	F.	L. A.	B.						*	
42	Epine Dumas	m.	r. o. p.	y. r.	v. g.	F.	L. A.	.....						*	†
	Bell Epine Dumas, Duc de Bordeau.														
43	Flemish Beauty	l.	r. ob. p.	y. g.	v. g.	F. M.	E. A.	B.							
44	Fontenay	m.	r. a. p.	y. r.	v. g.	F. M.	A.	F.							
	Jalousie de Fontenay Vendee														
45	Foster's Seckel	s.	ob. p.	y. r.	b.	F. M.	E. A.	Am.						*	
46	Frederick Clapp	m.	r. ob. p.	y.	b.	F. M.	E. A.	Am.						*	†
47	Fulton	s.	r. ob.	y. r.	v. g.	F.	A.	Am.						*	
48	Giffard	m.	p.	y. g.	v. g.	F. M.	S.	F.						*	**
	Beurre Giffard														
49	Glout Morceau	l.	ob. p.	y.	g.	.....	L. A.	.....						*	
50	Goodale	l.	ob. p.	y. g.	v. g.	F. M.	A.	Am.			*	†		*	
51	Gray Doyenne	m.	r.	y. r.	b.	F. M.	L. A.	F.							
52	Hardy	l.	ob. p.	y. g.	v. g.	F. M.	E. A.	.....			*			*	**
	Beurre Hardy.														
53	Harris	m.	o. b. o. p.	y. r.	v. g.	F.	E. A.	Am.						*	
54	Helen Gregoire	m.	r. o. p.	y. g.	v. g.	F.	E. A.	F.							
55	Henkel	l.	r. ob. p.	y. r.	v. g.	F.	E. A.	B.						*	†
56	Hosenschenk	m.	r. ob.	y.	g.	M.	S.	Am.						*	
	Moore's Pound.														
57	Howell	l.	r. p.	y. g.	v. g.	F. M.	E. A.	Am.						*	
58	Jaminette	m.	r. ob.	y. r.	g.	F. M.	W.	.....							
59	John Williams	m.	.....	.....	v. g.	.....	W.	Am.							
60	Jonah	l.	.....	.....	g.	F. M.	W.	Am.							
	Winter Jonah.														
61	Josephine of Malines	m.	r. ob. p.	y. r.	v. g.	F. M.	W.	F.				*		*	†
62	Julienne	s.	r. ob.	y.	g.	F. M.	S.	.....							
63	Kieffer	l.	r. o. p.	y. r.	g.	F. M.	A.	Am.							
64	Kingsessing	l.	ob. p.	y.	g.	F. M.	E. A.	Am.						*	
65	Kirtland	m.	r. ob.	y. r.	v. g.	F. M.	E. A.	Am.							
66	Knight	m.	r. ob.	y.	g.	M.	A.	Am.						*	
	Knight's Seedling.														
67	Langelier	m.	ob. p.	y. r.	v. g.	F. M.	W.	F.						*	
	Beurre Langelier.														
68	Lawrence	m.	r. o. p.	y. r.	v. g.	F. M.	W.	Am.			*			**	
69	Le Conte	l.	ob. p.	y.	g.	M.	S.	Am.							
70	Lindley	m.	r. ob.	y. g.	v. g.	F.	E. A.	F.						*	
	De Lindley.														
71	Louise Bonne of Jersey	l.	ob. p.	y. g.	v. g.	F. M.	E. A.	F.						*	
72	Madeleine	m.	p.	y. g.	v. g.	F. M.	S.	F.							
73	Madame Andre Leroy	l.	o. b. o. p.	y. r.	v. g.	F.	E. A.	F.							
74	Madame Eliza	l.	r. a. p.	y. r.	v. g.	F. M.	A.	B.						*	
75	Madame Treyve	m.	r. o. p.	y. r.	v. g.	F.	L. S.	F.							
76	Manning's Elizabeth	s.	ob. p.	y. r.	v. g.	F.	S.	.....						*	
77	Marie Louise	l.	p.	y. r.	v. g.	F.	A.	B.						*	
78	Margaret	m.	ob. p.	y. g.	b.	F.	S.	F.							
	Petite Marguerite														
79	McLaughlin	l.	ob. p.	y. g.	v. g.	F. M.	W.	Am.						*	
80	Merriam	m.	r. ob.	y. r.	g.	F. M.	A.	Am.						**	
81	Mount Vernon	m.	r. o. p.	y. r.	v. g.	F. M.	L. A.	Am.						*	
82	Napoleon	l.	ob. p.	y.	g.	M.	A.	B.							
83	Onondaga	l.	ob. p.	y. g.	v. g.	F. M.	L. A.	Am.						*	
	Seaver's Orange.														
84	Osband's Summer	s.	r. p.	y. g.	v. g.	F.	S.	Am.						*	
85	Ott	s.	r.	y. g.	g.	F.	S.	Am.							
86	Paradise of Autumn	l.	r. a. p.	y. r.	v. g.	F.	E. A.	B.						**	
	Paradis d'Automne														
87	Passe Colmar	l.	r. o. p.	y.	g.	M.	W.	B.						*	
88	Pitmaston Boston	s.	r. ob.	y. g.	g.	.....	S.	Am.						*	†
89	Poiteau	l.	p.	y.	g.	M.	L. A.	B.							
	Nouveau Poiteau.														

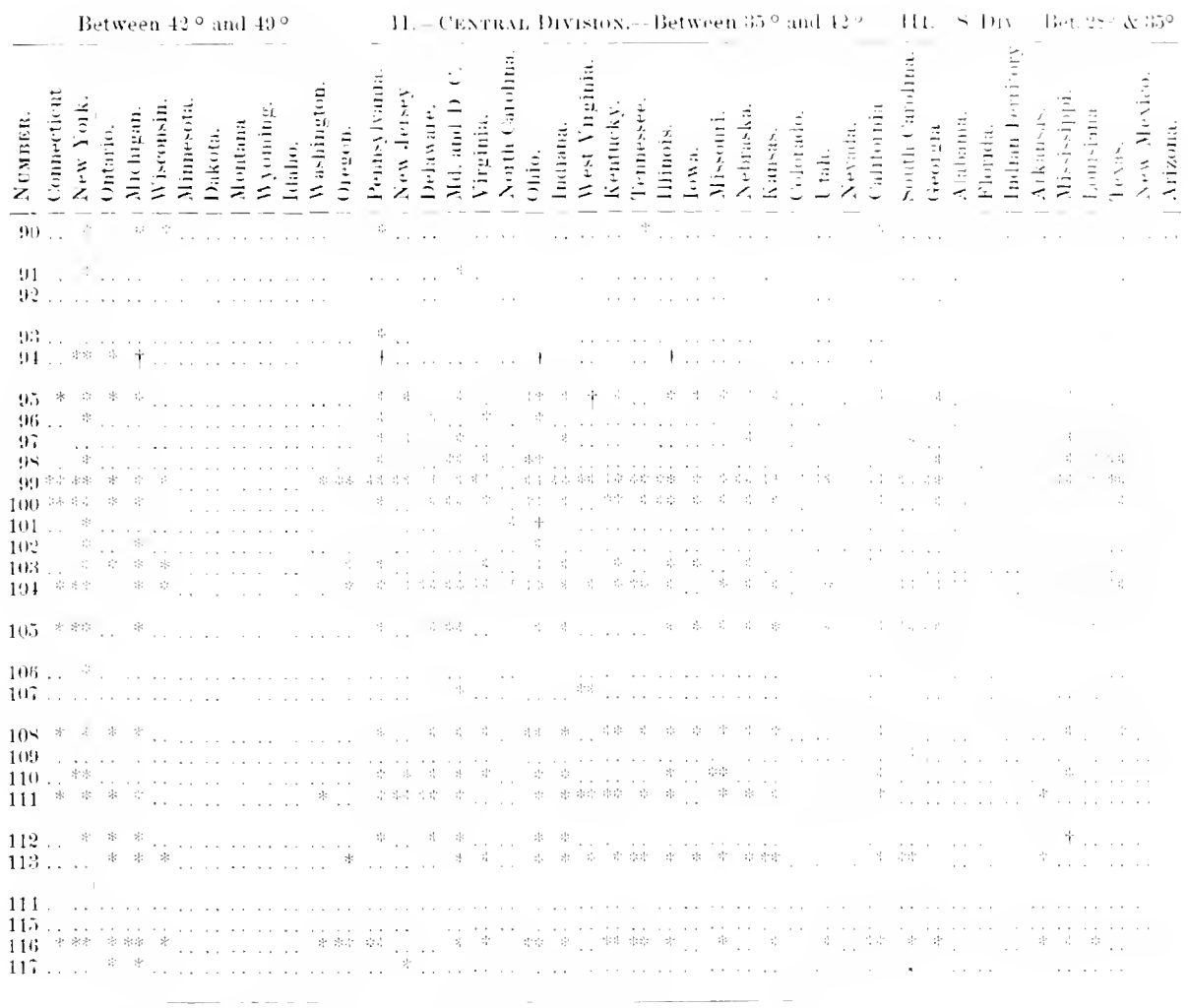
51 Fails in Eastern States.
58 An old variety; very healthy and productive.
59 Supposed to be Columbia
61 The finest late winter melting pear, where it succeeds.
68 A hardy tree; valuable.
71 Very productive and profitable



47 A hardy, productive tree.
49 Unreliable at the North.
72 Some say liable to blight.
77 A capital pear but unreliable
78 Superior to Summer Doyenne.
80 Valuable for market

Number	NAME.	DESCRIPTION.							I. N. Div.						
		Size	Form	Color	Quality	Use	Season	Origin.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
90	Pound	l	p.	y.	g.	K. M	W.	.....	...				..	*	..
	Belle Angevine, Winter Bell, Verdate's St Germain.														
91	Pratt	m	ob. p	y. r.	g.	M	E. A	Am	...			†	.	*	*
92	Quimper	m.	r. p.	y. g. v	g.	F.	S	B	.		.....		*	*	†
	Suprême de Quimper.														
93	Reading	l	ob. p	y. r	g.	F. M.	W	Am	.....				....		
94	Reeder	s	r. o. p	y. r.	b	F	L. A	Am.				..	...	†	..
	Dr. Reeder														
95	Rostiezer	s	p.	y. g	b.	F.	S.	....			*	*	*	*	*
96	Rutter	m	r. ob.	y. g. v.	g.	F. M	A	Am.	.....				....		.
97	St. Ghislain	m.	p.	y	g.	F. M	E. A	B	.				*	*	..
98	St. Michael Archange	l	r. p.	y. g.	g.	F. M	A.	F.	...			*	..	*	*
99	Seckel	s	r.	y. g	b.	F. M	A	Am.	*			*	*	*	*
100	Sheldon	m	r	y. g. v.	g.	F. M	A	Am	...			*	*	*	*
101	Souvenir du Congres	l	p. y. r	y. g. v.	g.	F. M	S	F	*			†	..	*	†
102	Sterling	m	r	y. g. v	g.	F. M	E. A	Am.	.				....	*	.
103	Stevens' Genesee	l.	r	y	v. g.	F. M	E. A.	Am.	*				....		
104	Summer Doyenne	s	r. o. p	y. g. v.	g.	F	S.	B	.			*	*	*	*
	Doyenné d' Eté.														
105	Superfin	m	r. p.	y. r. v.	g.	F.	A	F.	....			*	.	*	*
	Beurré Superfin														
106	Therese Appert	m	ob. o. p	y. r. v.	g.	F	L. S	F	..						
107	Triumph of Jodoigne	l.	ob. p	y. g. v	g.	F. M	A	B.							
	Triomphe de Jodoigne.														
108	Tyson	m	r. o. p.	y. g	b.	F	S.	Am.	...			*	*	*	*
109	Upper Crust (local)	m.	r	g. r.	poor	.....	S	Am.							
110	Urbaniste	m	p	y. g.	v.	F. M	A	B	.				*		
111	Vicar	l	p.	y	g.	K. M	W	F	*				*		
	Vicar of Winkfield, Le Cure.														
112	Washington	m.	ob. o. p	y	v. g.	F. M	E. A	Am	.				..		
113	White Doyenne	m	ob. p.	y. g.	b.	F. M.	A	F	.....				*		
	Virgalieu.														
114	Wilbur	s	r.	y. r.	g.	F	E. A	Am	.				..		
115	Willermoz	l	ob. p	y. r.	g.	M	W	B	.				..		
116	Winter Nelis	m.	ob. p	y. r	b.	F. M.	W	B	*				*	*	*
117	Windsor	l.	p.	g	g.	M	S	.	.				....	*	..
	Summer Bell.														

94 Delicious, but too small to meet the present market wants.
101 One of the largest and most beautiful melting pears.
108 A hardy tree.



113 One of the best, but variable in the Eastern and Middle States.
116 Of rare excellence; requires age ere profitable.
117 Of poor quality, but profitable for market in some places.

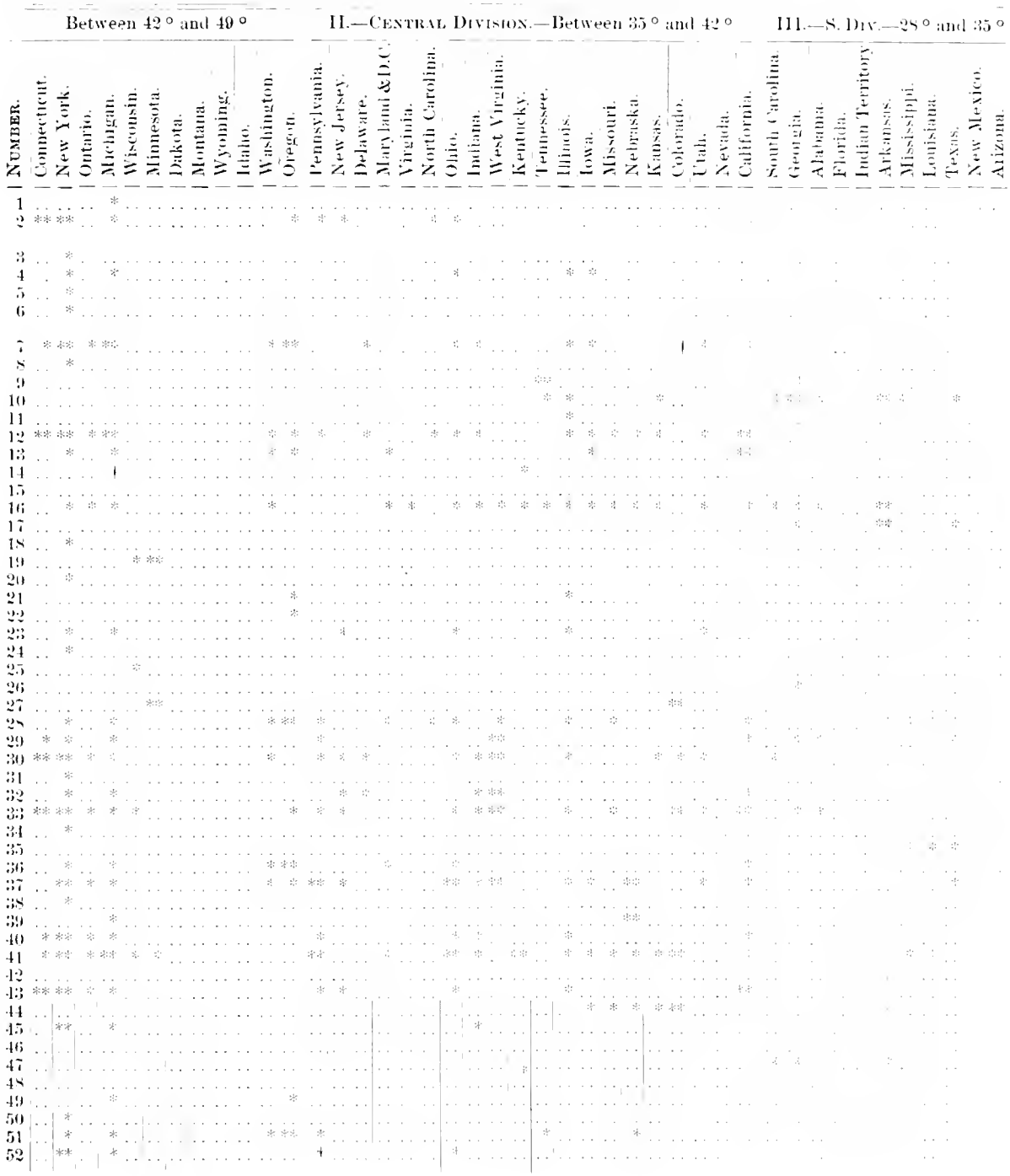
XV.—PLUMS.

The columns explain SIZE—l., large; m., medium; s., small FORM—r., roundish; o., oval; r. o., roundish oval; o. ob., oval obovate. COLOR—p., purplish or very dark; r., reddish or copper color; y., yellow; g. y., greenish yellow; y. r., yellowish with shades or spots of red. QUALITY—g., good; v. g., very good; b., best. USE—F., family; M., market. SEASON—E., early; M., medium; L., late. ORIGIN Am., American; F., foreign.

NUMBER	NAME.	DESCRIPTION.							I.—N. DIV.						
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Admiral												*		
2	Bavay's Green Gage *Reine Claude de Bavay.*	l	r.	g. y.	b.	F.	L.	F.	*		*	*	*	*	*
3	Belgian Purple	l	r. o.	p. y.	v. g.	F. M.	M	F.							
4	Bleeker's Gage	m.	r. o.	y	v. g.	F. M.	M.	Am.			*				
5	Blue Imperatrice	m.	o. ob.	p.	v. g.	F. M.	L.	F.							
6	Boddaert *Boddaert's Green Gage.*	l.	r.	g. r.	v. g.	F. M	M	F.							
7	Bradshaw	l.	o. ob.	r. p.	g.	M	M.	Am. ?	*		*			*	
8	Bryanstone Gage	m.	o	y. r.	v. g.	F.	L.	F.						†	
9	Canawa, *Peach Leaved*	m.	o.	r.	g.	F. M	V. L.	Am.							
10	Chickasaw	s.	r.	y. r.	g.	M	L.	Am.							
11	Coe's Late Red	m.	r.	p.	v. g.	F. M.	L.	F.							
12	Coe's Golden Drop	l.	o.	y. r	v. g.	F. M.	L.	F.	*		*		*	*	**
13	Columbia	l.	r	p.	g.	M.	M	Am.	*		*		*		
14	Copper	m.	o.	p.	g.	F. M	M.	F.							
15	Crüger's Scarlet	m.	r. o.	r.	g.	F.	M.	F.					*		
16	Damson	s	o.	p.	g.	M	L.	Am.	*		*		*		
17	De Caradeuc	m.	r.	y. r.	g.	F. M	E.	Am.							
18	De Montfort	m.	r.	p	v. g.	F. M.	E.	F.							
19	De Soto	m.	r. o.	y. r.	v. g.	F. M	M.	Am.							
20	Denniston, *Denniston's Superb*	l.	r	g. y.	v. g.	F. M.	M.	Am.							
21	Domine Dull	m.	o.	p.	g.	M.	M.	Am.							
22	Drap d'Or	s.	r.	y.	g.	F	E.	F.							
23	Duane's Purple	l	o	r. p.	g.	F. M	E.	Am.	*				*	*	*
24	Early Favorite	m.	r. o.	p.	g.	F	E	F.					*		
25	Eldridge														
26	Ellry	s.	o.	p	g.	F. M	M.	Eng.							
27	Forest Garden	m.	r.	r	v. g.	F. M.	E.	Am.							
28	German Prune	l.	o.	p.	g.	F. M	M.	F.	*						†
29	General Hand	l.	r. o.	g. y.	g.	F. M	M.	Am.							*
30	Green Gage	s	r.	g. y	b.	F.	M.	F.	*		*	*	*	*	*
31	Hudson Gage	m.	r.	g. y.	v. g.	F. M	E.	Am.							
32	Huling's Superb	l.	r. o.	g. y.	g.	F. M.	M.	Am.			*		*		
33	Imperial Gage	l.	o.	g. y.	b.	F. M	M.	Am.	*		*		*	*	**
34	Imperial Ottoman	m.	r.	y.	g.	F.	E.	F.					*		
35	Indian Chief														
36	Italian Prune, *Fellenberg*	m.	o.	p.	g.	F. M.	M.	F.					*		
37	Jefferson	l.	o.	y. r.	b.	F. M.	M.	Am.			*		*	*	*
38	July Green Gage	m.	r.	y. r.	v. g.	F	E.	F.							
39	Kirke's	m.	r. o.	p.	g.	F.	M.	F.							
40	Lawrence's Favorite	l.	r.	g. y.	b.	F.	M.	Am.					*		*
41	Lombard	m.	r. o	r. p.	g.	M.	M.	Am.	*		*	*	**	*	*
42	Long Scarlet, *Scarlet Gage*	m.	r. ob.	r.	g.	F.	M.	F.				*			
43	McLaughlin	l.	r.	y. r.	b	F. M.	M.	Am.	*		*		*	*	*
44	Miner	m.	obl.	r.	g.	F. M.	M.	Am.							
45	Monroe	m.	o.	g. y.	g.	M.	M.	Am.							
46	Moore's Artic	m.	r. o.	p.	g.	F. M	M.	Am.		*	*		*		
47	Newman	m.	o.	r.	g.	F. M	E.	Am.							
48	Nota Bene (Corse)	l.	r.	r. g.	g.	F.	M.	Am.					*		
49	Orleans, *Red Damask*	m.	r.	r.	g.	F.	M.	F.							
50	Oullin's Golden, *Oullin's Golden Gage*	l.	r. o.	g. y.	v. g.	F. M.	M.	F.							
51	Peach	l.	r.	p.	g.	M.	E.	F.					*	*	
52	Pond's Seedling, *Foothill*	l.	o.	y. r.	g.	M.	M.	F.	*					*	*

XV—PLUMS.

The columns explain: SIZE—l., large; m., medium; s., small. FORM—r., roundish; o., oval; r. o., roundish oval; o. ob., oval obovate. COLOR—p., purplish or very dark; r., reddish or copper color; y., yellow; g. y., greenish yellow; y. r., yellowish with shades or spots of red. QUALITY—g., good; v. g., very good; b., best. USE—F., family; M., market. SEASON—E., early; M., medium; L., late. ORIGIN—Am., American; F., foreign.



Number	Names	Description.							I.—N. Div.—						
		Size.	Form.	Color.	Quality.	Use.	Season.	Origin.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
53	Prince Engelbert	l.	o.	p.	v. g.	F. M	M.	F.	..	..	..	..	..	†	†
54	Prince's Yellow Gage	m.	o.	y.	v. g.	F. M	E.	Am.	*	..	..	..	*	*	*
55	Prune of Agen	m.	o	p.	b.	F.	Mi.	F	..	..	..	..	..	..	†
56	Purple Gage	m	r	p	v. g	F. M.	M.	.....	..	..	*	..	..	..	..
57	Purple Favorite	m.	r. ob	p	b.	F. M	E.	Am.	..	..	..	..	..	..	..
58	Reagles' Gage	m.	r	g. y.	v. g.	F. M.	M.	Am.	..	..	..	..	..	..	..
59	Richland	m	o.	p.	g.	F. M.	M.	Am	..	..	..	..	..	..	..
60	Quackenboss	l	r	p.	g.	M.	M.	Am.	*	..	..	..	..	..	..
61	Royale Hative	m.	r	p.	v. g.	F. M.	E.	F.	..	..	..	..	..	..	..
62	Royale de Tours	l.	r	r.	g.	M.	E.	F.	..	..	..	..	..	..	..
63	Schenectady Catherine	m.	r. o.	r.	g.	F.	M	Am.	..	..	..	..	..	..	..
64	Shropshire Damson	s	o	p	g.	F. M.	L.	Eng.	..	..	..	..	..	..	..
65	Smith's Orleans	l	o.	r. p	v. g.	F. M.	M.	Am.	*	..	..	..	..	*	..
66	St. Catherine	m.	ob	g. y	v. g.	M.	L.	F	..	..	..	..	..	..	..
67	St. Martin, *St. Martin's Quetsche*	m	o.	g. y	g.	M.	L	F.	..	..	..	..	..	..	..
68	Sharp's Emperor, *Victoria*	l.	r. o.	y. r.	g.	M.	M.	F.	..	..	..	..	..	*	..
69	Temple	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70	Transparent, *Transparent Gage*	m.	r. ob.	g. y.	v. g.	F.	M.	F.	..	..	..	..	..	..	..
71	Wangenheim	m	o.	p.	g.	M	M.	F	..	..	..	..	..	..	..
72	Washington	l	r. o.	g. y	v. g.	F. M.	M.	Am.	*	..	..	..	*	*	*
73	Weaver	m	flat	r	v. g.	F. M	M.	Am.	..	..	..	..	..	..	..
74	Wild Goose	s	o	y. r.	g.	M.	M.	Am.	..	..	..	..	..	..	..
75	Yellow Egg, *White Magnum Bonum*	l.	o	y.	g.	F. M	M.	.....	*	..	*	..	*	..	*

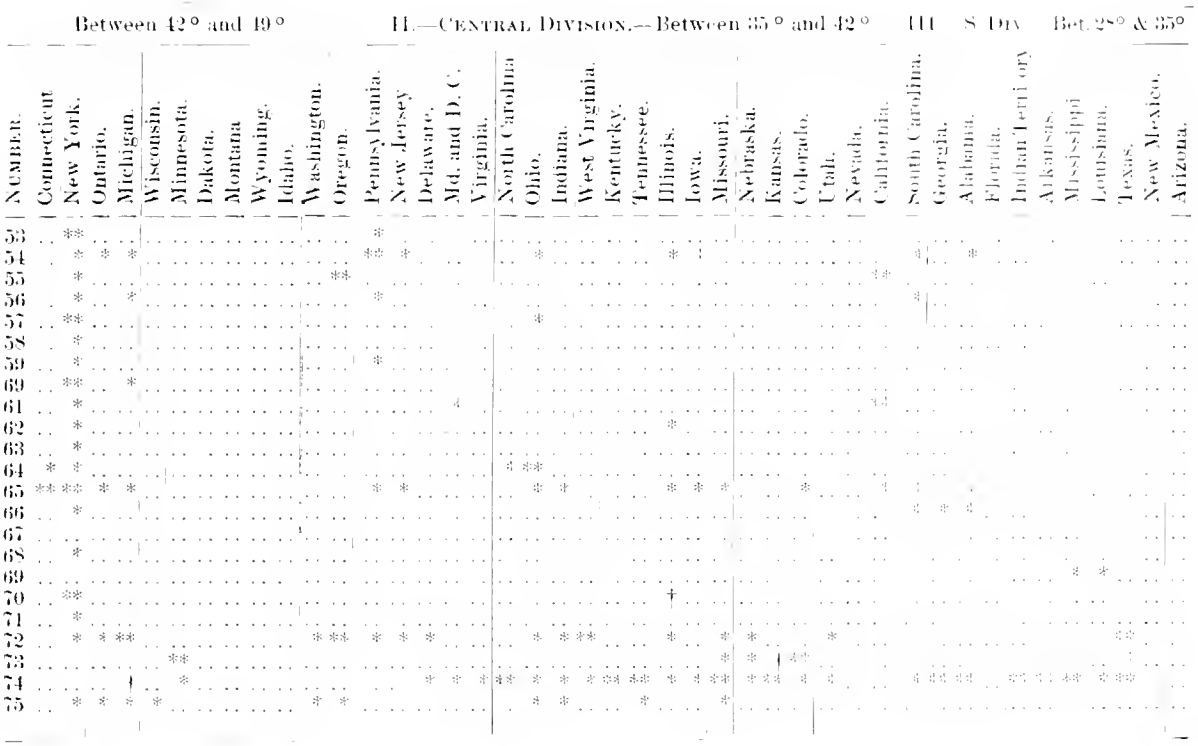
XVI QUINCES.

The columns explain: Size—L., large; m., medium; v. l., very large. Form—ob. p., oblate pyriform; r., roundish; r. ob. p., roundish obtuse pyriform. Color y., yellowish or yellowish green. Quality t., tender; h. t., half tender. Use—K., kitchen; M., market. Season—E., early; E to L., early to late. Origin—Am., American; F. foreign

Number.	Names	Description.							I.—N. Div.						
		Size.	Form.	Color.	Quality.	Use.	Season	Origin.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island
1	Angers	v. l.	ob. p.	y.	t	M. K	E to L.	F.	*	..	†	..	..	*	..
2	Apple or Orange	l	r.	y.	h. t.	M. K.	E. to L	.....	*	..	*	*	..	*	*
3	Champion	v. l.	ob. p.	y.	g.	M. K.	L.	Am.	..	..	..	..	..	..	..
4	Chinese	v. l.	ob.	y.	h. t.	K.	L.	F.	..	..	..	..	..	..	..
5	Pear	l.	p.	y.	g.	M. K	L.	Am.	*	..	..	..	..	..	..
6	Portugal	v. l.	ob. p	y.	t	M. K.	E.	F	..	..	..	..	..	..	..
7	Rea	l.	r ob. p.	y.	h. t.	M. K.	E.	Am.	..	..	..	..	..	..	..

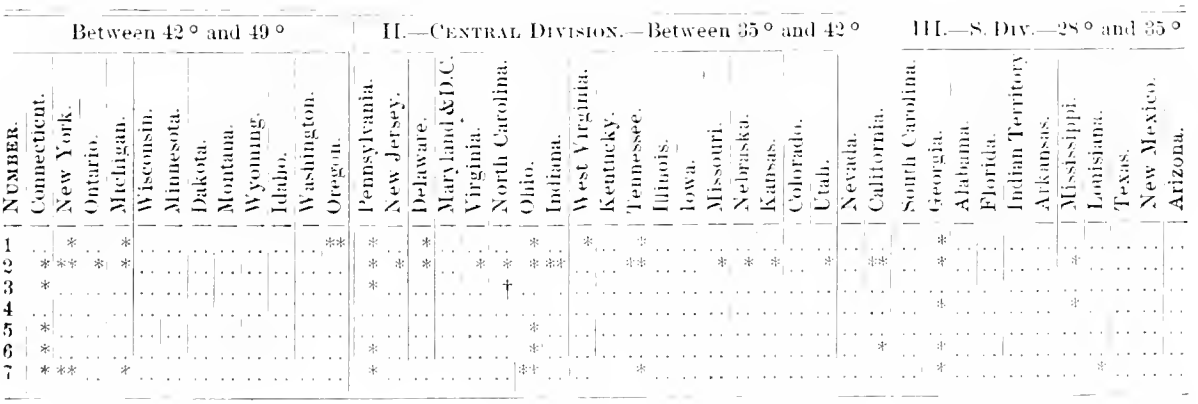
3 A new variety not extensively tested.

4 Large and valuable at the South, in strong soils



XVI—QUINCES.

The columns explain: Size—l., large; m., medium; v. l., very large. Form—ob. p., oblate pyriform; r., roundish; r. ob. p., roundish obtuse pyriform. Color—y., yellowish or yellowish green. Quality—t., tender; h. t., half tender. Use—K., kitchen; M., market. Season—E., early; E. to L., early to late. Origin—Am., American; F., foreign.



XVII—RASPBERRIES.

The columns explain: SIZE. l., large, m., medium; s., small. FORM r, roundish; r c., roundish conical; c, conical; ob. c., obtuse conical. COLOR—b., black; r., redish; p., purplish; y., yellow. QUALITY—g, good; v. g., very good; b, best. USE—M., most profitable for market; F. M., of value for family and market; F., mostly valued for the family dessert. SEASON—E., early; L., late; M., medium ORIGIN—Am., American; F., foreign.

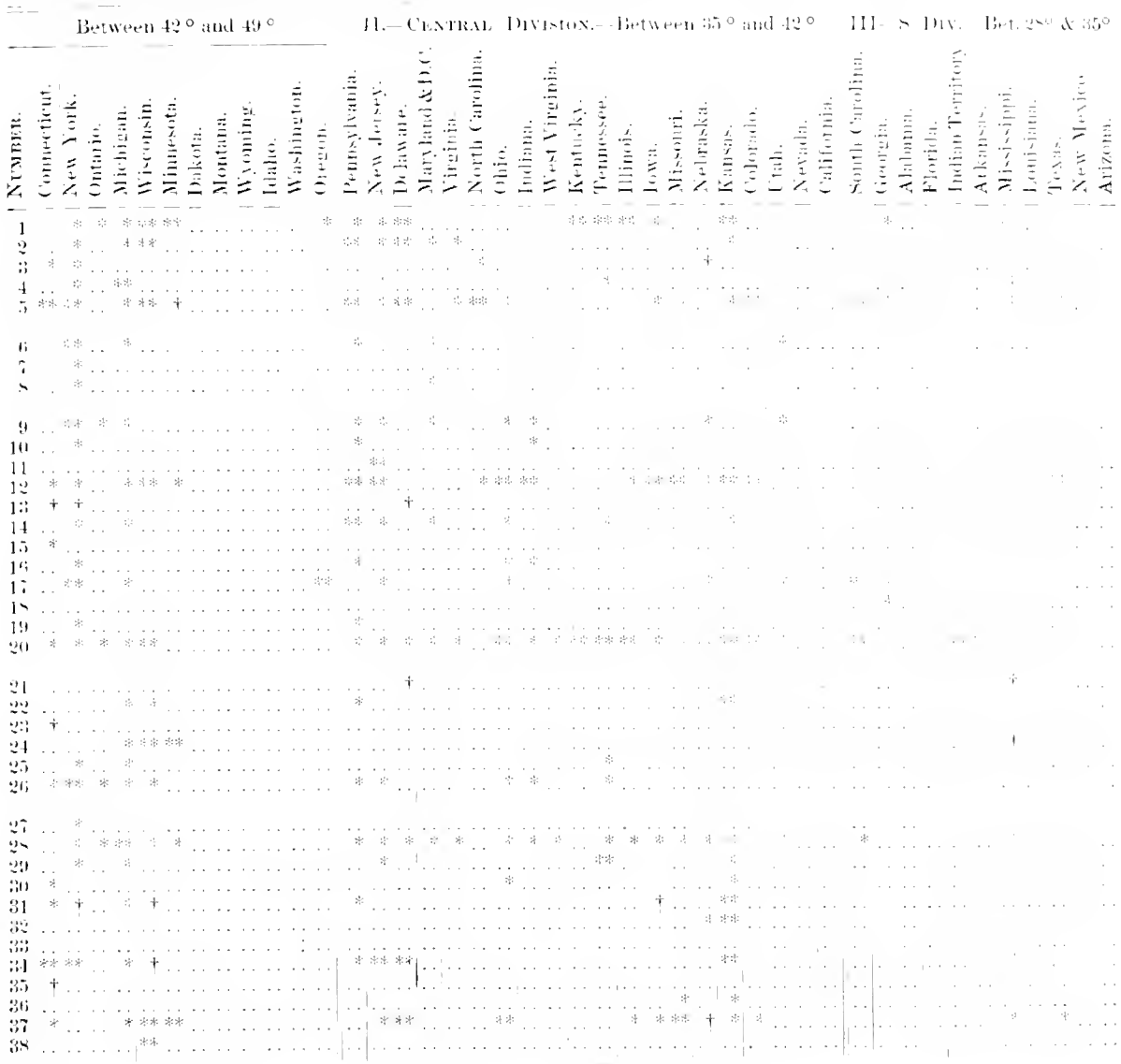
NUMBER	NAMES	DESCRIPTION.							I.—N. DIV.—						
		SIZE.	FORM.	COLOR.	QUALITY.	USE.	SEASON.	ORIGIN.	Nova Scotia	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	American Black (c), *Doolittle*	s	r	b.	g.	M	M	Am.					*		*
2	Brandywine, *Susquaco*	m.	r c	r.	g.	F. M.	M	Am.							
3	Caroline	l.	r ob	y	g.	F. M.	M	Am.						*	
4	Clarke	m	r	r.	g.	F. M	E.	Am.				*	*	*	*
5	Cuthbert	l.	r, ob c	r	g.	F. M	M	Am.					*	*	*
	Queen of the Market														
6	Fastolf	l	r c	r.	v. g	F.	M.	F							
7	Fontenay, *Belle de Fontenay*	l.	c	r	g.	F.	L.	F							
8	Four Seasons Red	l	r c.	r.	v. g.	F	L.	F.							
	Merveille de Quatre Saisons, October Red														
9	Franconia	l.	r c	p.	v. g.	F. M	M.	F.						**	*
10	French	m.	r	r	v. g	F.	M.	Am.			*				
11	Golden Queen	l	r c	y.	v. g.	F. M.	M.	Am.							*
12	Gregg (c)	v. l.	r.	b	g.	F. M.	M.	Am.					*		†
13	Hansell	m.	r, ob.	r	v. g	F. M	V E.	Am.							†
14	Herstine	l.	ob c.	r	v. g.	F. M.	M.	Am						*	*
15	Highland Hardy	m.	r, ob.c.	r.	g.	F. M.	E.	Am.							
16	Hornet	l.	c.	r	v. g.	F M	M.	F.						*	
17	Hudson River Antwerp	l	c.	r	b	F. M.	M.	Am.	*				*		
18	Imperial Red	m.	r	r.	b.	F. M.	M.	Am							
19	Knevett	l.	ob c.	r	b	F	M.	F			*		*	*	*
20	McCormick (c)	m.	ob c.	b	v. g.	F M.	L.	Am.			*		*	*	*
	Mammoth Cluster.														
21	Marlboro	l.	r c	r	g.	F. M	M.	Am.							†
22	Miama (c)	m.	r	b.	g.	F. M	M	Am.							
23	Montclair	l	r.	p.	v. g.	F. M	M.	Am.							
24	Ohio (c)	m.	r	b.	g.	F M	M.	Am.							
25	Ohio Everbearing (c)	m.	c	b.	g.	F M	L.	Am							
26	Orange	l	c	y	b	F	M	Am.	*		*		*	*	*
	Brinckle's.														
27	Pelham	l.	c	r.	v. g	F	M.	F.							
28	Philadelphia	m.	r.	p	g	M.	M.	Am.			*				*
29	Purple Cane (c)	m	r.	p.	g.	M	M	Am.							
30	Reliance	l.	r, ob.	r.	g.	F. M.	M.	Am.							
31	Shaffer's Colossal (c)	v. l	r	p.	g.	F. M.	M	Am							
32	Smith's (c)	v. l.	r.	b	g	F M.	M.	Am.							
33	Sonchetti	l.	c.	y.	g.	F	M.	F.						*	
34	Southegan (c)	m	r.	b	g	F		Am.				*	**		†
35	Superb	l.	r.	r.	v. g	F. M	M.	Am.							†
36	Thwack	l.	r.	p r.	g.	F. M.	M.	Am.							
37	Turner	m.	r.	r.	g.	F. M.	M	Am.							†
38	Tyler	m.	r.	b.	v. g.	F. M.	E.	Am.							†

NOTE.—Those designated thus (c) are varieties of Blackcap (*Rubus occidentalis.*)

7 Best of Autumnal bearing sorts. 26 Valued for family use.

XVII. RASPBERRIES.

The columns explain: Size—l., large; m., medium; s., small. Form—r., roundish; r. c., roundish conical; c., conical; ob. c., obtuse conical. Color—b., black; r., reddish; p., purplish; y., yellow. Quality—g., good; v. g., very good; b., best. Use—M., most profitable for market; F. M., of value for family and market; F., mostly valued for the family dessert. Season—E., early; L., late; M., medium. Origin—Am., American; F., foreign.



XVIII—STRAWBERRIES.

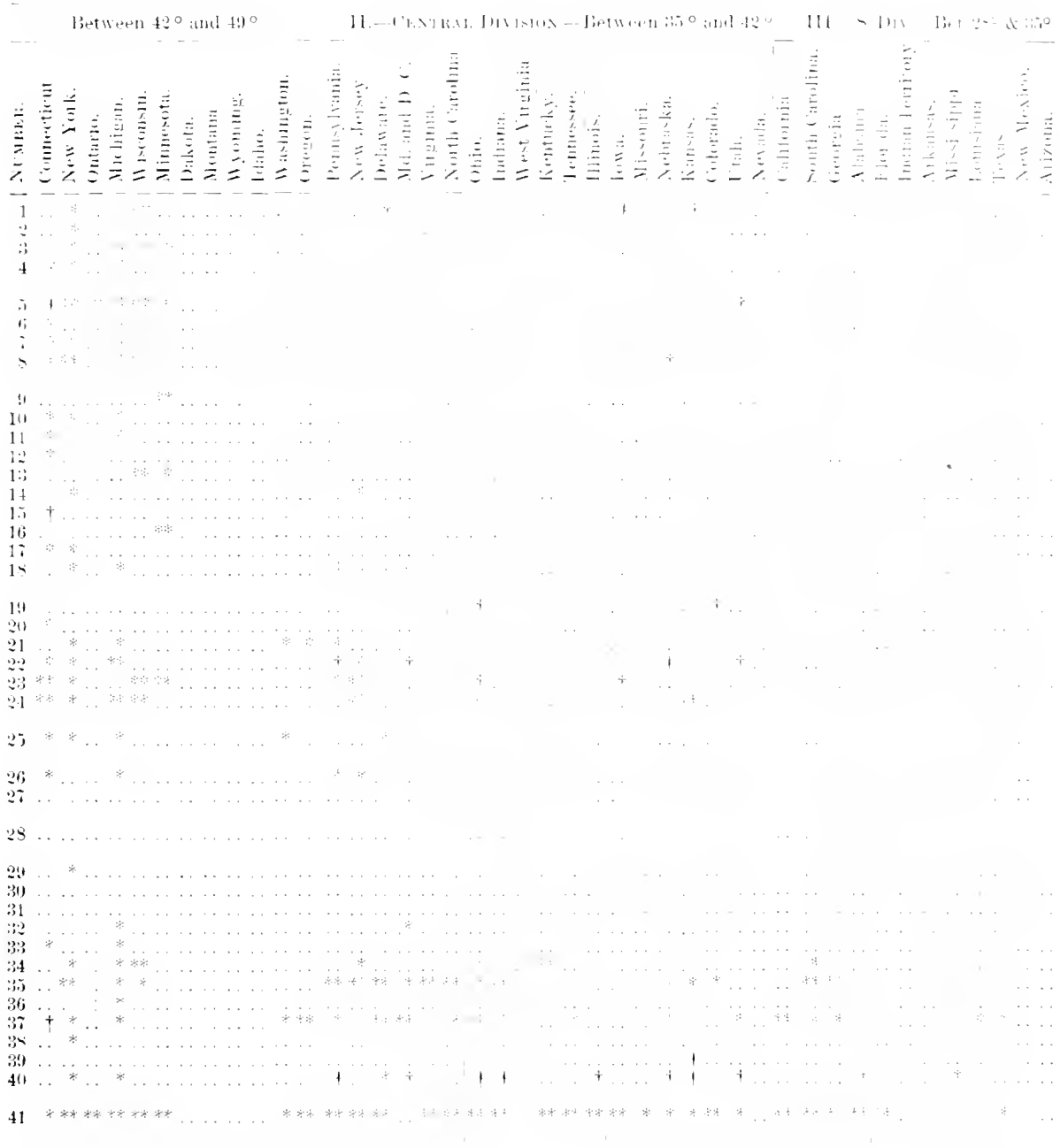
The columns explain: SIZE—l., large; s., small; m., medium. SEX—H., hermaphrodite; P., pistillate. COLOR—d. c., deep crimson; d. s., deep scarlet; b. s., bright scrarlet; w. t., whitish tinted with red; l. c., light crimson. FORM—r. c., roundish conical; o. c., obtuse conical or coxcomb form; c., conical; r., roundish; r. o. c., roundish obtuse conical. FLESH—s., soft; f., firm; m., medium. SEASON—E., early; M., medium; L., late; E. L., early to late. ORIGIN—Am., American; F., foreign.

NUMBER.	NAMES.	DESCRIPTION.							I.—N. DIV.					
		SIZE.	SEX.	COLOR.	FORM.	FLESH.	SEASON.	ORIGIN.	Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts	Rhode Island.
1	Bidwell	v. l.	H.	b. s.	c.	f.	M.	Am.							
2	Black Defiance	l.	H.	d. r.	r. o. c.	f.	M.	Am.				*			
3	Captain Jack	l.	H.	d. r.	r. c.	f.	L.	Am.				*			
4	Champion *Windsor Chief.*	l.	P.	d. c.	r.	m.	L.	Am.	*			†			*
5	Charles Downing	l.	H.	d. s.	c.	f.	M.	Am.	*			*	*	**	*
6	Col. Cheney	l.	P.	b. s.	o. c.	f.	M.	Am.	*		*			*	
7	Crescent	l.	P.	b. s.	r. c.	m.	M.	Am.	*			*		*	*
8	Cumberland *Cumberland Triumph.*	v. l.	H.	b. s.	r. c.	s.	M.	Am.	*			†	**	*	†
9	Downer's Prolific	m. l.	H.	b. s.	r. c.	s.	E.	Am.							
10	Duchess	l.	H.	b. r.	r. c.	f.	E.	Am.							*
11	Duncan	m.	H.	b. r.	r. c.	s.	E.	Am.							†
12	Finch	l.	H.	s.	r.	f.	M.	Am.							
13	Glendale	l.	P.	b. r.	c.	f.	L.	Am.	*			*			
14	Great American	l.	H.	d. r.	r. c.	f.	M.	Am.							
15	Gypsy	m.	P.	c.	.....	f.	M.	Am.				†			
16	Hart's Minnesota	m.	H.	c.	r.	f.	E.	Am.							
17	Hervey Davis	l.	H.	b. s.	o. c.	f.	M.	Am.						**	
18	Hovey *Hovey's Seedling.*	l.	P.	b. s.	r.	f.	M.	Am.	*		*		*	*	
19	James Vick	m.	H.	c.	r. c.	m.	M.	Am.							
20	Jersey Queen	v. l.	P.	b. s.	r. c.	f.	L.	Am.				†			*
21	Jucunda	l.	H.	b. s.	o. c.	f.	L.	F.	**						*
22	Kentucky	l.	H.	b. s.	r. c.	f.	L.	Am.				†		*	
23	Manchester	l.	P.	s.	o. c.	f.	M.	Am.				†		*	*
24	Miner's Prolific *Miner's Great Prolific.*	v. l.	H.	c.	r. c.	m.	M.	Am.	*			*		*	**
25	Monarch *Monarch of the West.*	v. l.	H.	b. r.	r. o. c.	f.	M.	Am.							
26	Mount Vernon	l.	H.	l. s.	r. o. c.	m.	L.	Am.							*
27	Neunan *Neunan's Prolific, Charleston.*	l.	.....	l. s.	c.	f.	M.	Am.							
28	Old Iron Clad *Phelps' Seedling.*	l.	H.	s.	o. c.	f.	M.	Am.				†			
29	Pioneer	l.	H.	c.	r.	m.	M.	Am.						*	*
30	Piper's Seedling	l.	H.	c.	r. c.	f.	E.	Am.				†			
31	Primo	m.	H.	s.	c.	f.	L.	Am.				†		*	
32	Russell's Advance	l.	H.	c.	r.	f.	L.	Am.							
33	Seneca Queen	l.	H.	d. c.	c.	m.	L.	Am.							†
34	Seth Boyden	l.	H.	r.	o. c.	f.	M.	Am.	*					*	*
35	Sharpless	v. l.	H.	b. r.	o. c.	f.	M.	Am.				*	*	**	*
36	Shirts	v. l.	H.	b. c.	c.	f.	M.	Am.							
37	Triomphe de Gand	l.	H.	l. c.	o. c.	f.	M.	F.	*		*		*	*	
38	Triple Crown	l.	H.	d. c.	c.	f.	M.	Am.							
39	Truitt's Surprise	l.	H.	d. r.	o. c.	f.	M.	Am.							
40	Wilder *President Wilder.*	l.	H.	d. s.	r. o. c.	f.	M.	Am.			*			*	†
41	Wilson *Wilson's Albany.*	l.	H.	d. c.	r. c.	f.	E. L.	Am.	**		*	*	**	*	

4 Valuable late sort. 14 Needs good soil and high cultivation. 18 An old and highly valued sort.
27 Chiefly grown for market at Charleston and other points South. Quality medium to poor.

XVIII—STRAWBERRIES.

The columns explain: SIZE L., large; s., small; m., medium. SEX H., hermaphrodite; P., pistillate. COLOR: d. c., deep crimson; d. s., deep scarlet; b. s., bright scarlet; w. t., whitish tinted with red; l. c., light crimson. FORM—r. c., roundish conical; o. c., obtuse conical or coxcomb form; c., conical; r., roundish; r. o. c., roundish obtuse conical. FLESH—s., soft; f., firm; m., medium. SEASON E., early; M., medium; L., late; E. L., early to late. ORIGIN Am., American; F., foreign.



35 Has made a first rate record over a large portion of the country.

41 Unrivaled as a market sort in most parts of the country. Quality poor.

CATALOGUE

OF

Native and Introduced Species of Fruits and Nuts,

IN THE UNITED STATES AND CANADA.

NOTE.—The following Catalogue is intended to include all species of introduced *Fruits* and *Nuts* growing or cultivated in the open air in any part of the United States or the Dominion of Canada, that have proved to be or promise to be of value to the grower.

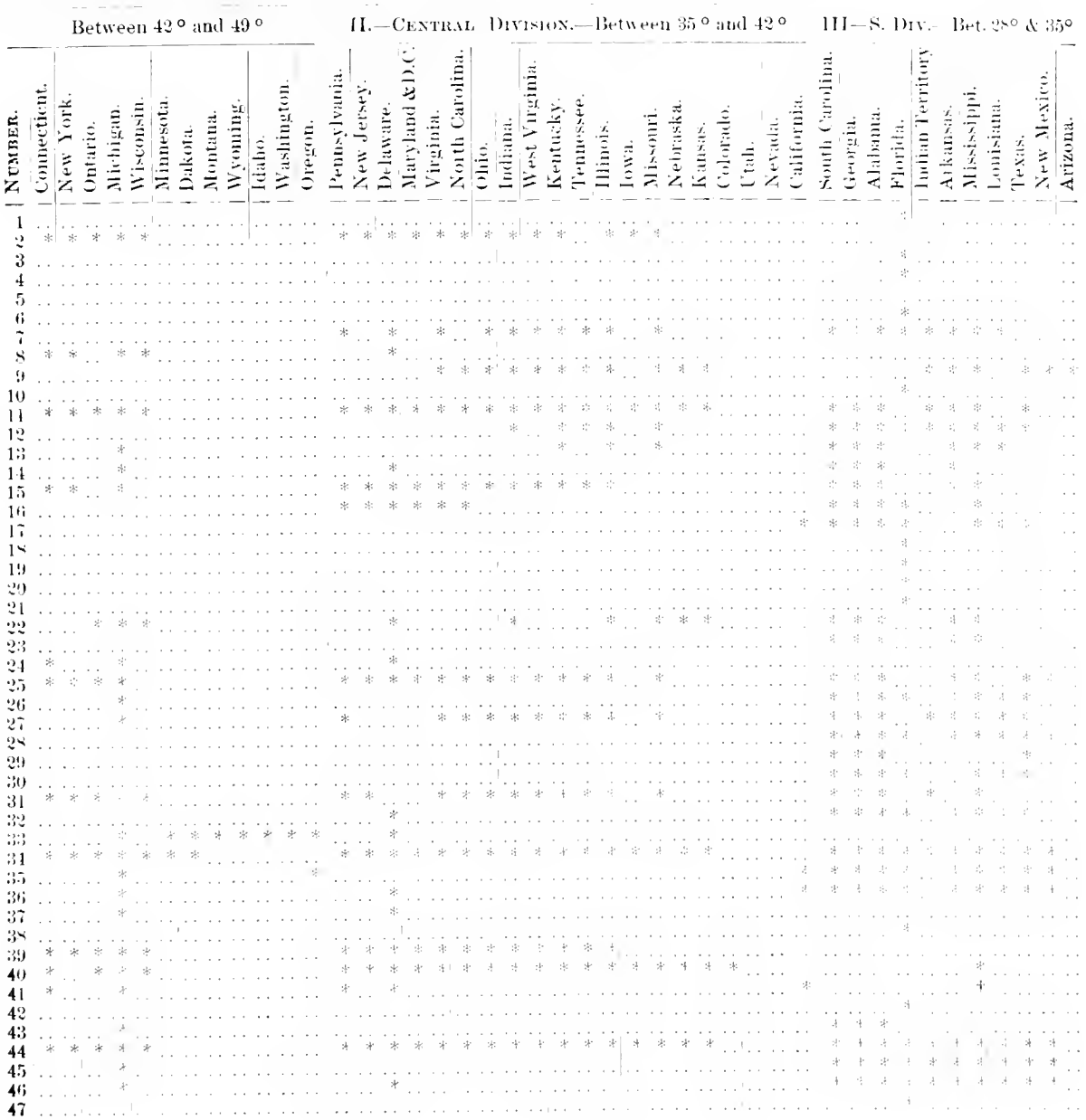
The "starring" of this first table has necessarily been done with insufficient data, and any information that will help to perfect it or to make additions to the list itself will be thankfully received.

NUMBER	NAMES. BOTANICAL.	COMMON.	ORIGIN.	I.—N. DIV. Nova Scotia.	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
1	Achras sapota	Sapodilla Plum								
2	Amelancier Canadensis	Service	N.	*	*	*	*	*	*	*
3	Ananassa sativa	Pine Apple								
4	Anona Cherimolia	Cherimoyer								
5	Anona squamosa	Sweetsop								
6	Anona muricata	Soursop								
7	Asimina triloba	Pawpaw	N.							
8	Berberis vulgaris	Barberry		*					*	*
9	Cactus opuntia	Indian Fig								
10	Carica Papaya	West Indian Pawpaw								
11	Carya alba	Shell bark Hickory	N.	*					*	*
12	Carya olivæformis	Pecan	N.							
13	Carya sulcata	Large Shell bark Hickory	N.							
14	Castanea vesca	European Chestnut								
15	Castanea Americana	American Chestnut	N.	*		*	*	*	*	*
16	Castanea pumila	Chinquipin	N.							
17	Citrus Aurantium	Orange								
18	Citrus Limonum	Lemon								
19	Citrus Limetta	Lime								
20	Citrus medica	Citron								
21	Cocus nucifera	Cocoa nut								
22	Corylus Americana	American Hazel	N.	*						
23	Corylus Avellana	Filbert		*						
24	Corylus rostrata	Beaked Hazel-nut	N.				*	*	*	*
25	Cydonia vulgaris	Quince		*						*
26	Cydonia Sinensis	Chinese Quince								
27	Diospyros Virginiana	Persimmon	N.							
28	Diospyros Kaki	Japanese Persimmon								
29	Diospyros Texana	Black Persimmon	N.							
30	Eriobotrya Japonica	Loquat								
31	Fagus ferruginea	Beech	N.	*	*	*	*	*	*	*
32	Ficus Carica	Fig								
33	Fragaria vesca	Alpine Strawberry	N.	*						
34	Fragaria Virginiana	American Strawberry	N.	*	*	*	*	*	*	*
35	Fragaria Chilensis	South American Strawberry	N.	*						
36	Gaylussacia resinosa	Black Huckleberry	N.	*						
37	Gaylussacia frondosa	Blue Dungleberry	N.							
38	Grias cauliflora	Anchovy Pear								
39	Juglans cinerea	Butternut	N.				*	*	*	*
40	Juglans nigra	Black Walnut	N.							*
41	Junglans regia	European Walnut								
42	Laurus Persea	Avocado, or Alligator Pear								
43	Mespilus Germanica	Medlar		*						
44	Morus rubra	Red Mulberry	N.	*					*	*
45	Morus nigra	Black Mulberry								
46	Morus alba	White Mulberry								
47	Musa paradisiaca	Plaintain								

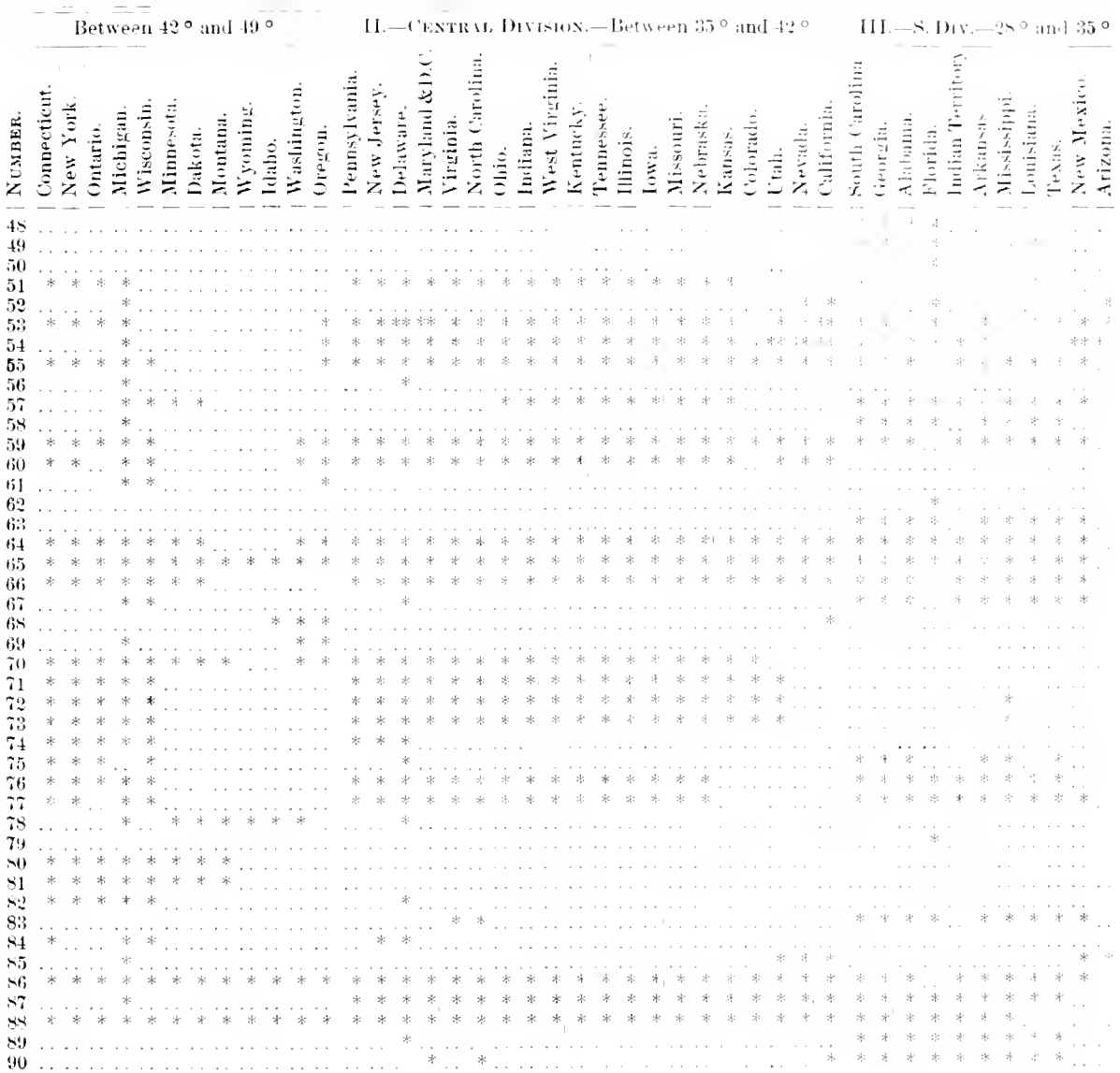
CATALOGUE
OF
Native and Introduced Species of Fruits and Nuts,
IN THE UNITED STATES AND CANADA.

NOTE--The following Catalogue is intended to include all species of introduced *Fruits* and *Nuts* growing or cultivated in the open air in any part of the United States or the Dominion of Canada, that have proved to be or promise to be valuable to the grower.

The "starring" of this first table has necessarily been done with insufficient data, and any information that will help to perfect it or make additions to the list itself will be thankfully received.



Number	NAMES BOTANICAL.	NAMES COMMON	Origin.	I.—N. Div. Nova Scotia	New Brunswick	Maine.	New Hampshire	Vermont.	Massachusetts.	Rhode Island.
48	Musa sapientum	Banana								
49	Olea Europea	Olive								
50	Phœnix dactylifera	Date Palm								
51	Podophyllum peltatum	May Apple	N.						*	*
52	Prunus (Amygdalus) communis	Almond								
53	Prunus (Amygdalus) Persica	Peach		*					*	*
54	Prunus Armeniaca	Apricot		*						
55	Prunus domestica	Garden Plum		*	*	*	*	*	*	*
56	Prunus maratima	Beach Plum	N.	*						
57	Prunus Americana	Wild red and yellow Plum	N.	*						
58	Prunus Chicasa	Chickasaw Plum	N.							
59	Prunus cerasus	Garden red Cherry (Morello, etc.)		*	*	*	*	*	*	*
60	Prunus avium	Bird Cherry (Heart, etc.)						*	*	*
61	Prunus pumila	Dwarf Cherry	N.	*						
62	Psidium pyriferum	Guava								
63	Punica Granatum	Pomegranate								
64	Pyrus communis	Pear		*		*	*	*	**	*
65	Pyrus Malus	Apple		*	*	*	*	*	*	*
66	Pyrus prunifolia	Siberian Crab		*	*		*	*	*	*
67	Pyrus coronaria	American Crab	N.	*						
68	Pyrus rivularis	Oregon Crab	N.							
69	Ribes Grossularia	English Gooseberry		*	*					
70	Ribes hirtellum	Houghton Gooseberry, etc	N.			*	*	*	*	*
71	Ribes rubrum	Red Currant	N.	*	*	*	*	*	*	*
72	Ribes nigrum	Black Currant	N.	*	*	*	*	*	*	*
73	Rubus occidentalis	Black Cap Raspberry	N.	*	*	*	*	*	*	*
74	Rubus Idæus	European Raspberry		*	*	*	*	*	*	*
75	Rubus strigosus	Wild Red Raspberry	N.	*	*	*	*	*	*	*
76	Rubus villosus	Blackberry	N.	*		*	*	*	*	*
77	Rubus canadensis	Dewberry	N.	*					*	*
78	Shepherdia argentea	Buffalo Berry	N.							
79	Tamarindus Indica	Tamarind								
80	Vaccinium Pennsylvanicum	Dwarf Early Blueberry	N.				*	*	*	*
81	Vaccinium canadense	Canada Blueberry	N.	*			*	*	*	*
82	Vaccinium corymbosum	Swamp Blueberry	N.	*			*	*	*	*
83	Vaccinium tenellum	Southern Blueberry	N.							
84	Vaccinium macrocarpa	American Cranberry	N.	*						
85	Vitis vinifera	European Grape								
86	Vitis Labrusca	Northern Fox Grape (Concord, etc.)	N.			*	*	*	*	*
87	Vitis æstivalis	Summer Grape (Herbemont, etc.)	N.							
88	Vitis cordifolia	Winter Grape (Clinton, etc.)	N.	*	*	*	*	*	*	*
89	Vitis vulpina	Bullace Grape (Muscadine, etc.)	N.							
90	Zizyphus sativus	Jujube								


Between 42° and 49°
II.—Central Division.—Between 35° and 42°
III.—S. Div.—28° and 35°
Number.
Connecticut.
New York.
Ontario.
Michigan.
Wisconsin.
Minnesota.
Dakota.
Montana.
Wyoming.
Idaho.
Washington.
Oregon.
Pennsylvania.
New Jersey.
Delaware.
Maryland & D.C.
Virginia.
North Carolina.
Ohio.
Indiana.
West Virginia.
Kentucky.
Tennessee.
Illinois.
Iowa.
Missouri.
Nebraska.
Kansas.
Colorado.
Utah.
Nevada.
California.
South Carolina
Georgia.
Alabama.
Florida.
Indian Territory
Arkansas
Mississippi.
Louisiana.
Texas.
New Mexico.
Arizona.

CHANGES IN NOMENCLATURE.

The following lists comprise all the names which have been changed in the Society's Catalogue:

APPLES.

NAME REJECTED.	NAME ADOPTED.
American Golden Pippin	American Golden.
American Summer Pearman	American Summer.
Carolina Red June	Carolina June.
Chenango Strawberry	Chenango.
Cooper's Early White	Cooper's Early.
Cox's Orange Pippin	Cox's Orange.
Danver's Winter Sweet	Danver's Sweet.
Duchess of Oldenburg	Oldenburg.
Early Red Margaret	Early Margaret.
Hubbardston Nonsuch	Hubbardston.
Jewett's Fine Red	Jewett's Red.
Kentucky Red Streak	Kentucky Red.
King of Tompkins County	Tompkins King.
Kirkbridge White	Kirkbridge.
Large Yellow Bough	Sweet Bough.
Marquis of Lorne	Lorne.
Marston's Red Winter	Marston's Red.
Otoe Red Streak	Otoe.
Pleasant Valley Pippin	Pleasant Valley.
Pyle's Red Winter	Pyle's Winter.
Striped Sweet Pippin	Striped Sweet.
Tewksbury Winter Blush	Tewksbury Winter.
Twenty Ounce Apple	Twenty Ounce.

CHERRIES.

Bigarreau of Mezel	Mezel.
Early Purple Guigne	Early Purple.
Empress Eugenie	Eugenie.
Knight's Early Black	Knight's Early.

CURRANTS.

Fertile 'd Angers	Angers.
Fertile de Palluau	Palluau.
Knight's Large Red	Knight's Red.
La Versaillaise	Versaillaise.

GOOSEBERRIES.

Smith's Improved	Smith's.
Woodward's Whitesmith	Whitesmith

GRAPES.

Hartford Prolific	Hartford.

FOREIGN GRAPES.

Calabrian Raisin	Calabrian
Early Silver Frontignan	Silver Frontignan.
Lady Downes' Seedling	Lady Downes.
Mrs. Pince's Black Muscat	Mrs. Pince's Muscat.
Wilmot's Black Hamburg	Wilmot's Hamburg.

PEACHES.

Amsden's June	Amsden.
Austin's Late Red	Austin's Late.
Cole's Early Red	Cole's Early.
Cook's Late White	Cook's Late.
Crackett's Late White	Crackett's Late.
Early Albert	Albert.
Early Beatrice	Beatrice.
Early Louise	Louise.
Early Rivers	Rivers.
Early Tillotson	Tillotson.

PEACHES.

NAME REJECTED.	NAME ADOPTED.
Harker's Seedling	Harker.
Hoover's Late Heath	Hoover's Heath.
Van Zandt's Superb	Van Zandt.
Ward's Late Free	Ward's Late.

PEARS.

Belle Epine Dumas	Epine Dumas.
Beurre Bosc	Bosc.
Beurre Clairgeau	Clairgeau.
Beurre d'Amanlis	Amanlis.
Beurre d'Anjou	Anjou.
Beurre de Brignais	Brignais.
Beurre Diel	Diel.
Beurre Giffard	Giffard.
Beurre Hardy	Hardy.
Beurre Langelier	Langelier.
Beurre Superfin	Superfin.
Bonne du Puits Ansault	Ansalut.
Dearborn's Seedling	Dearborn.
Doyenne Boussock	Boussock.
Doyenne d'Ete	Summer Doyenne.
Doyenne du Comice	Comice.
Dr. Bachman	Bachman.
Dr Lindley	Lindley.
Duchesse d'Angouleme	Angouleme.
Duchesse de Bordeaux	Bordeaux.
Golden Beurre of Billboa	Billboa.
Jalousie de Fontenay Vendee	Fontenay.
Josephine de Malines	Josephine of Malines.
Knight's Seedling	Knight.
Louise Bonne de Jersey	Louise Bonne of Jersey
Nouveau Poiteau	Poiteau.
Paradis d'Automme	Paradise of Autumn.
Petite Marguerite	Margaret.
Supreme de Quimper	Quimper.
Triomphe de Jodoigne	Triumph of Jodoigne.
Vicar of Winkfield	Vicar.
Winter Jonah	Jonah.

PLUMS.

Boddaert's Green Gage	Boddaert.
Denniston's Superb	Denniston.
Oullin's Golden Gage	Oullin's Golden.
Transparent Gage	Transparent.

QUINCES.

Rea's Seedling	Rea.

RASPBERRIES.

Belle de Palluau	Palluau.
Belle de Fontenay	Fontenay
Knevett's Giants	Knevett.
Merveille de Quartre Saisons	Four Seasons Red.

STRAWBERRIES.

Cumberland Triumph	Cumberland.
Hovey's Seedling	Hovey.
Miner's Great Prolific	Miner's Prolific.
Monarch of the West	Monarch.
Neunan's Prolific	Neunan.
President Wilder	Wilder.
Wilson's Albany	Wilson.

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